Pre-Algebra with Pizzazz!

Practice in Skills and Concepts

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The authors . . .

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A MESSAGE FROM THE AUTHORS

Pre-Algebra With Pizzazz! is a series of enrichment books designed to provide practice with skills and concepts taught in pre-algebra classes.

The authors believe that mastery of math skills and concepts requires good teaching and also a great deal of practice. Our goal is to provide puzzle activities that make this practice more effective. We have tried to build into these activities certain characteristics that increase the effectiveness of practice:

1. **Motivating Goal for the Student.** Each puzzle has a goal that is motivating to students. Students work problems in order to discover the punch line of a joke or riddle, decode a humorous poem or one-liner, create an interesting picture, etc. Thus, the solution is a built-in reward to the student when he or she completes the puzzle. In addition, the variety and novelty of procedures for solving puzzles help capture and maintain student interest.

2. **Knowledge of Results.** Various devices are used in the puzzles to tell students whether or not their answers are correct. In most of the puzzles, feedback occurs immediately after the student works each exercise. For example, if a particular answer is not in the code or scrambled answer list, the student knows it is incorrect. The student can then try again or ask for help. Additional feedback occurs when the student achieves a puzzle solution that is appropriate. We have found that students greatly appreciate and benefit from this immediate knowledge of results.

3. **Focus on a Single, Clear Objective.** Though review puzzles are included which involve multiple objectives, most of the puzzles focus on single objectives. The skills and concepts required for each puzzle are limited so that students with different levels of ability, though possibly requiring differing amounts of preliminary instruction, can experience success. In some puzzles, the exercises are sequenced so that students can discover a pattern, generalization, or method for solving a different type of exercise. Our goal is for all students to feel successful when doing mathematics.

In addition to these efforts to make the puzzles highly effective, we have tried to make Pre-Algebra With Pizzazz! easy to use. Two lists of objectives—a summary list and a complete list—and the specific puzzles that provide practice for each objective are given on pages v–xix. The major objectives of most pre-algebra textbooks are included within this series. We have tried to arrange the puzzles on a given topic so that each puzzle builds on skills and concepts previously covered. Nearly all Pre-Algebra With Pizzazz! puzzles require only one page. Finally, because the puzzles are self-correcting, they help eliminate the task of correcting assignments.

We hope you enjoy using Pre-Algebra With Pizzazz! as much as we enjoyed writing it.

Steve and Janis Marcy
Suggestions for Using Pre-Algebra With Pizzazz!

Pre-Algebra With Pizzazz! puzzles can serve a variety of purposes. They are suitable for classwork or homework practice following introduction of a new skill or concept. They are ideal for an individualized program, as students can work independently on puzzles selected to meet their specific needs. Finally, the puzzles can be a valuable addition to a math lab.

1. Reproduction. Pre-Algebra With Pizzazz! pages may be removed from the binder and used as blackline masters. The pages are especially accessible and easy to use.

2. Directions. Directions for each puzzle are simple and concise. Most students will have no difficulty getting started on most of the puzzles, though you may occasionally want to work through the first problem with your students, showing where the answers are to go, etc. An overhead transparency of a puzzle may facilitate discussion, especially for puzzles that include geometric figures. Students sometimes get excited and call out the solution, so you may want to caution your class about this before they begin working.

3. Objectives. Two lists of objectives—a summary list and a complete list (expressed in terms of learner behaviors)—and the specific puzzles that provide practice for each objective are given on pages v–xix. These objectives may be helpful in planning or in writing test items.

4. Showing Work. Though some exercises can be done mentally, many require paper-and-pencil (or calculator) computations. If you require the use of paper and pencil, you may wish to have students hand in their scratch paper for each puzzle with the work for each problem identified. If students use calculators, you may want them to hand in a record of computations performed. Requiring students to show their work can help in diagnosing individual strengths and weaknesses.

Other Books by Steve and Janis Marcy published by Creative Publications:

- Middle School Math With Pizzazz! Book A: Operations with whole numbers, basic facts, place value, and numeration
- Middle School Math With Pizzazz! Book B: Decimals, operations, applications, and problem-solving strategies
- Middle School Math With Pizzazz! Book C: Fraction concepts and operations, number theory, and relating fractions and decimals
- Middle School Math With Pizzazz! Book D: Measurement, geometry, area, perimeter, angles, square roots, and right triangles
- Middle School Math With Pizzazz! Book E: Percent, probability, ratio and proportion, statistics, integers, and equations
- Algebra With Pizzazz!: Practice activities for first-year algebra students
# PART AA

## SUMMARY TABLE OF OBJECTIVES

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   - Add, subtract, and multiply integers ................. 21
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PART AA
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46. Graph a linear equation in two variables ........................................................................ 240
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DIRECTIONS:
Below you see pairs of letters and numbers. Write each letter above the number line at the point that corresponds to its number. A special message will appear!
What did Cinderella say to the photographer?

To answer this question, follow these directions:

1. Each number in the boxes below stands for a point on the number line.
2. Find the correct point for any of these numbers. Then write the corresponding letter at that point above the number.
3. Keep working and see what develops!
- FIND THE MESSAGE -

TO FIND THE HIDDEN MESSAGE, FOLLOW THESE DIRECTIONS:

Each row going across has 7 rectangles. Only 3 of them contain a number that meets the requirement for that row. Circle these 3 numbers in each row.

Over each number you have circled, notice the small number and letter. The small number tells you where to put the letter in the row of boxes at the bottom of the page. You will spell out a five-word message.

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<td>-16/2</td>
<td>-10</td>
<td>-1/3</td>
<td>-12</td>
<td></td>
</tr>
<tr>
<td>LESS THAN -1</td>
<td>-3/2</td>
<td>0</td>
<td>-1/2</td>
<td>-1</td>
<td>-5</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>GREATER THAN 0</td>
<td>-1/4</td>
<td>15</td>
<td>7/8</td>
<td>0</td>
<td>-11</td>
<td>3 1/3</td>
<td></td>
</tr>
</tbody>
</table>

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
WHAT DID THE SNOWPLOW SAY ABOUT THE BLIZZARD?

Each arrow below represents a number. Find the number in the boxes at the bottom of the page and write the corresponding letter above it. When you finish, you will know the plane truth!

O
-3 -2 -1 0 1 2 3 4

R
-2 -1 0 1 2 3 4 5

L
-5 -4 -3 -2 -1 0 1 2

N
-4 -3 -2 -1 0 1 2 3

I
-2 -1 0 1 2 3 4 5

M
-6 -5 -4 -3 -2 -1 0 1

W
-4 -3 -2 -1 0 1 2 3

T
1 0 1 2 3 4 5 6

E
-3 -2 -1 0 1 2 3 4

P
0 1 2 3 4 5 6 7

O
0 1 2 3 4 5 6 7

B
-5 -4 -3 -2 -1 0 1 2

S
-5 -4 -3 -2 -1 0 1 2

S
-3 -2 -1 0 1 2 3 4

-6 6 7 -2 -5 2 5 -7 -3 3 4 -4 -1 1

PRE-ALGEBRA WITH PIZZAZZ!
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**When does a BARBERSHOP QUARTET have 16 legs?**

TO ANSWER THIS QUESTION:

1. Identify the number represented by each arrow in the 8 exercises on the left.
2. Determine the number that goes in each lettered box in the table on the right.

After doing each exercise, find your answer at the bottom of the page and write the corresponding letter above it.

<table>
<thead>
<tr>
<th>ARROW STARTING POINT COORDINATE</th>
<th>DIRECTION AND LENGTH OF ARROW</th>
<th>ARROW ENDPOINT COORDINATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>POSITIVE, 6</td>
<td>E</td>
</tr>
<tr>
<td>O</td>
<td>POSITIVE, 2</td>
<td>A</td>
</tr>
<tr>
<td>I</td>
<td>NEGATIVE, 10</td>
<td>N</td>
</tr>
<tr>
<td>R</td>
<td>NEGATIVE, 7</td>
<td>H</td>
</tr>
<tr>
<td>O</td>
<td>NEGATIVE, $\frac{1}{2}$</td>
<td>E</td>
</tr>
<tr>
<td>R</td>
<td>POSITIVE, 8 $\frac{1}{2}$</td>
<td>E</td>
</tr>
<tr>
<td>O</td>
<td>NEGATIVE, $\frac{1}{4}$</td>
<td>R</td>
</tr>
<tr>
<td>E</td>
<td>POSITIVE, 2 $\frac{1}{2}$</td>
<td>N</td>
</tr>
<tr>
<td>O</td>
<td>POSITIVE, 5 $\frac{1}{4}$</td>
<td>S</td>
</tr>
<tr>
<td>N</td>
<td>NEGATIVE, 6 $\frac{1}{2}$</td>
<td>S</td>
</tr>
<tr>
<td>N</td>
<td>POSITIVE, 9 $\frac{1}{2}$</td>
<td>P</td>
</tr>
<tr>
<td>N</td>
<td>NEGATIVE, $\frac{1}{2}$</td>
<td>N</td>
</tr>
<tr>
<td>N</td>
<td>NEGATIVE, $\frac{3}{5}$</td>
<td>T</td>
</tr>
</tbody>
</table>

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What is the Title of This Picture?

CODED TITLE:

-101 -89 -72 -179 -56 -6 -35 -89 -72 -75 -89 154 -6 -952 -109
-323 -109 -6 -800 -142 -259 -800 -6 -226 -952 -85 -75 -6 -72

TO DECODE THE TITLE OF THIS PICTURE:

Do any exercise below and find your answer in the coded title. Each time the answer appears in the code, write the letter of that exercise above it.

KEEP WORKING AND YOU WILL DECODE THE TITLE.

H  -45 + -30 =
D  -19 + -66 =
C  -9 + -87 =
G  -75 + -34 =
L  -90 + -52 =
T  -28 + -7 =
W  56 + 98 =
F  -241 + -18 =
E  -76 + -150 =
A  -4 + -319 =
U  -28 + -28 =
B  -899 + -1 =
N  -243 + -709 =
J  624 + 199 =
R  -500 + -300 =
I  -2 + -2 + -2 =
S  -6 + -25 + -41 =
Q  -68 + -99 + -12 =
O  -31 + -50 + -8 =
M  -85 + -6 + -10 =
DIRECTIONS:
Each arrow diagram on page 2 represents a number sentence. Find the number sentence for any of these diagrams in the answer columns below. Notice the CIRCLE DESIGN next to the answer.

Find the CIRCLE DESIGN of your answer in the code at the bottom of the page. Each time it appears, write the letter of the arrow diagram above it.

KEEP WORKING AND YOU WILL DECODE A "SONG FOR SAIL!"

\[
\begin{align*}
6 + (-7) &= -1 \\
-20 + 5 &= -15 \\
-10 + 20 &= 10 \\
-40 + 40 &= 0 \\
-3 + 5 &= 2 \\
60 + (-40) &= 20 \\
10 + (-4) &= 6 \\
-6 + 8 &= 2 \\
3 + (-3) &= 0 \\
-25 + 25 &= 0 \\
-30 + 50 &= 20 \\
10 + (-25) &= -15 \\
2 + (-6) &= -4 \\
-5 + 7 &= 2 \\
5 + (-1) &= 4 \\
-4 + 2 &= -2 \\
8 + (-12) &= -4 \\
-6 + 4 &= -2
\end{align*}
\]

TITLE: A SONG FOR SAIL
Do any exercise below and find your answer in the code key. Notice the letter above it. Print this letter in the box at the bottom of the page that contains the number of the exercise. Keep working and you will create a special message.

**CODE KEY**

| W | G | H | D | L | S | A | E | O | Y | I | U | T | C | M | R | P | N | F |
| -18 | -15 | -13 | -10 | -8 | -7 | -6 | -4 | -3 | -1 | 0 | 2 | 3 | 4 | 5 | 7 | 8 | 14 | 17 |

1. -8 + 2 =  
2. 6 + 8 =  
3. 5 + -9 =  
4. -9 + 1 =  
5. -3 + -1 =  
6. -1 + 5 =  
7. -3 + 6 =  
8. 9 + -2 =  
9. -3 + 3 =  
10. -5 + 9 =  
11. -7 + -3 =  
12. 8 + -8 =  
13. -1 + -6 =  
14. -20 + 7 =  
15. -9 + -9 =  
16. -7 + 1 =  

17. 2 + -9 =  
18. -9 + -4 =  
19. -7 + 3 =  
20. 3 + 4 =  
21. -7 + -8 =  
22. 4 + -8 =  
23. -6 + 9 =  
24. -10 + 3 =  
25. 6 + -7 =  
26. -9 + 6 =  
27. -3 + 5 =  
28. 2 + -5 =  
29. -7 + 9 =  
30. 8 + -5 =  
31. -1 + -2 =  
32. 8 + 9 =  
33. -8 + 1 =  
34. 3 + -6 =  
35. -2 + 7 =  
36. -5 + 1 =  
37. -1 + 4 =  
38. 4 + -7 =  
39. -4 + 6 =  
40. -9 + -6 =  
41. 7 + -20 =  
42. -15 + 8 =  
43. 7 + -3 =  
44. -1 + 8 =  
45. 3 + -9 =  
46. -1 + 9 =  
47. 8 + -12 =  
48. -3 + -4 =  

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24  
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48  

PRE-ALGEBRA WITH PIZZAZZ!  
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HOW'S BUSINESS?

SOLDIER: "Mine is
30 37 -2 8 -37 -22 -87 59 8 -78 -87 -47 -2"

BOXER: "Mine is
-78 26 0 37 8 8 0 -22 49 -93 2 0 -83 59"

STEAK
SAUCE
MAKER: "Mine is
-19 0 2 -2 59 -257 -22 -2 -186 59 -78 2"

MATH
TEACHER: "Mine is
-846 161 -78 -2 -2 -186"

EACH PERSON ABOVE IS ANSWERING THE QUESTION, "HOW'S BUSINESS?" TO DECODE THEIR ANSWERS:

Do any exercise below and find your answer in the code above. Each time the answer appears in the code, write the letter of that exercise above it. Keep working until you have decoded all four responses.

\[
\begin{align*}
1 & \quad 10 + -32 = \\
2 & \quad -15 + 41 = \\
3 & \quad -39 + -44 = \\
4 & \quad -27 + 86 = \\
5 & \quad 61 + -12 = \\
6 & \quad -75 + 28 = \\
7 & \quad -37 + -41 = \\
8 & \quad -165 + -92 = \\
9 & \quad 54 + -73 = \\
10 & \quad 83 + -53 = \\
11 & \quad -48 + 85 = \\
12 & \quad -85 + 48 = \\
13 & \quad -16 + -77 = \\
14 & \quad 63 + 98 = \\
15 & \quad -105 + 113 = \\
16 & \quad -50 + 50 = \\
17 & \quad 737 + -923 = \\
18 & \quad -285 + 198 = \\
19 & \quad -457 + -389 = \\
20 & \quad 95 + -93 = \\
21 & \quad -95 + 93 = 
\end{align*}
\]
Why did the BICYCLE go to a PSYCHIATRIST?

TO ANSWER THIS QUESTION, FOLLOW THESE DIRECTIONS:
Add the four numbers touching any letter below and write the sum next to the appropriate letter. Then find your answer in the code at the bottom of the page. Each time the answer appears in the code, write the corresponding letter above it. Keep working and you will decode the answer to the question.

\[
\begin{array}{cccc}
93 & 39 & 78 & -100 & -58 \\
I & B & S & E & \\
-10 & 52 & -3 & -44 & -89 \\
D & P & A & T & \\
95 & -61 & -50 & -16 & 34 \\
G & R & H & M & \\
40 & 75 & 11 & -48 & 7 \\
O & Y & C & L & \\
99 & 2 & -66 & -5 & 80 \\
\end{array}
\]

CODED
Do any exercise below and find your answer in the corresponding answer column. The letter of the exercise goes in the box that contains the number of the answer. Keep working and you will discover the answer to the title question.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>T 3 - 7</td>
<td>41 -10</td>
</tr>
<tr>
<td>R -2 - 5</td>
<td>9 8</td>
</tr>
<tr>
<td>E 7 - 1</td>
<td>13 -4</td>
</tr>
<tr>
<td>U 9 - 3</td>
<td>29 5</td>
</tr>
<tr>
<td>Q -5 - 10</td>
<td>23 -6</td>
</tr>
<tr>
<td>F 1 - 11</td>
<td>37 -7</td>
</tr>
<tr>
<td>H -8 - 2</td>
<td>32 6</td>
</tr>
<tr>
<td>C 4 - 4</td>
<td>15 -7</td>
</tr>
<tr>
<td>O -3 - 7</td>
<td>11 9</td>
</tr>
<tr>
<td>C -1 - 12</td>
<td>2 4</td>
</tr>
<tr>
<td>E 2 - 9</td>
<td>34 -13</td>
</tr>
<tr>
<td>F 17 - 4</td>
<td>31 -9</td>
</tr>
<tr>
<td>O -11 - 2</td>
<td>5 8</td>
</tr>
<tr>
<td>T 6 - 3</td>
<td>21 13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>E -5 - 15</td>
<td>10 17</td>
</tr>
<tr>
<td>R 8 - 9</td>
<td>24 8</td>
</tr>
<tr>
<td>D 3 - 13</td>
<td>12 2</td>
</tr>
<tr>
<td>Q -2 - 4</td>
<td>4 10</td>
</tr>
<tr>
<td>Y -6 - 6</td>
<td>17 -8</td>
</tr>
<tr>
<td>E 15 - 7</td>
<td>27 -10</td>
</tr>
<tr>
<td>D -9 - 1</td>
<td>30 -12</td>
</tr>
<tr>
<td>O 5 - 5</td>
<td>35 -1</td>
</tr>
<tr>
<td>E -4 - 10</td>
<td>20 0</td>
</tr>
<tr>
<td>T -9 - 5</td>
<td>7 4</td>
</tr>
<tr>
<td>N 6 - 7</td>
<td>28 17</td>
</tr>
<tr>
<td>S 15 - 2</td>
<td>14 -17</td>
</tr>
<tr>
<td>O -8 - 12</td>
<td>22 -4</td>
</tr>
<tr>
<td>H -11 - 6</td>
<td>19 -14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>C -7 - 8</td>
<td>25 10</td>
</tr>
<tr>
<td>S 2 - 5</td>
<td>26 2</td>
</tr>
<tr>
<td>M 13 - 4</td>
<td>42 0</td>
</tr>
<tr>
<td>O -2 - 20</td>
<td>33 -15</td>
</tr>
<tr>
<td>F -9 - 9</td>
<td>1 9</td>
</tr>
<tr>
<td>B 6 - 16</td>
<td>8 7</td>
</tr>
<tr>
<td>O -7 - 4</td>
<td>3 14</td>
</tr>
<tr>
<td>E 4 - 7</td>
<td>16 -3</td>
</tr>
<tr>
<td>L -4 - 7</td>
<td>36 -14</td>
</tr>
<tr>
<td>P 7 - 4</td>
<td>6 3</td>
</tr>
<tr>
<td>G -7 - 7</td>
<td>40 -11</td>
</tr>
<tr>
<td>V 7 - 7</td>
<td>18 0</td>
</tr>
<tr>
<td>D -7 - 7</td>
<td>39 11</td>
</tr>
</tbody>
</table>
What Did the Mama Cow Say to the Baby Cow?

TO ANSWER THIS QUESTION, FOLLOW THESE DIRECTIONS:

Draw a straight line connecting each exercise with its correct answer. Each line will cross a number and a letter. The number tells you where to put the letter in the row of boxes at the bottom of the page.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 - 6</td>
<td>-9</td>
</tr>
<tr>
<td>-15 - 6</td>
<td>-113</td>
</tr>
<tr>
<td>-15 - -6</td>
<td>-53</td>
</tr>
<tr>
<td>15 - 6</td>
<td>120</td>
</tr>
<tr>
<td>-83 - 30</td>
<td>21</td>
</tr>
<tr>
<td>-83 - -30</td>
<td>53</td>
</tr>
<tr>
<td>30 - -83</td>
<td>-24</td>
</tr>
<tr>
<td>-30 - -83</td>
<td>0</td>
</tr>
<tr>
<td>27 - 54</td>
<td>-21</td>
</tr>
<tr>
<td>-78 - -78</td>
<td>95</td>
</tr>
<tr>
<td>60 - -60</td>
<td>113</td>
</tr>
<tr>
<td>-47 - 77</td>
<td>-95</td>
</tr>
<tr>
<td>-47 - -77</td>
<td>-124</td>
</tr>
<tr>
<td>19 - 43</td>
<td>9</td>
</tr>
<tr>
<td>-36 - -18</td>
<td>-27</td>
</tr>
<tr>
<td>55 - -40</td>
<td>30</td>
</tr>
<tr>
<td>-40 - -55</td>
<td>-15</td>
</tr>
<tr>
<td>40 - -55</td>
<td>-18</td>
</tr>
</tbody>
</table>
What is the DIFFERENCE between UNLAWFUL and ILLEGAL?

THE ANSWER TO THIS QUESTION IS WRITTEN IN CODE AT THE BOTTOM OF THE PAGE, TO DECODE:

Do any exercise below and find your answer in the code. Each time the answer appears in the code, write the letter of that exercise above it. Keep working and you will discover the answer to the title question.

N  77 - 145 =  
T  -203 - 85 =  
E  -472 - 351 =  
C  86 - 527 =  
A  -140 - 891 =  
W  66 - 377 =  
F  736 - 439 =  
D  -442 - 397 =  
G  -608 - 519 =  
R  394 - 805 =  
H  500 - 300 =  
K  -79 - 788 =  
U  -413 - 48 =  
L  747 - 9 =  
I  -137 - 540 =  
B  803 - 900 =  
S  700 - 77 =  

-365  222  756  751  443  297  -365  756  403  623  751  -89  751  403  222  623  -118  
-118  800  -823  756  751  443  751  222  -839  403  756  756  -823  -89  751  756  
403  623  751  623  403  -441  -867  -97  403  -411  -839
What Should You Do If You Are Surrounded By 20 Lions, 15 Tigers And 10 Leopards?

Do any exercise below and find your answer in one of the boxes at the bottom of the page. Write the letter of the exercise in this box. (To make it easier to find your answer, the answers are arranged in order from smallest to largest.) Keep working and you will discover the answer to the title question.

\[
\begin{align*}
Y &: -6 + 2 = \\
O &: 3 - -7 = \\
D &: 9 + -4 = \\
E &: -7 + -2 = \\
U &: -3 - -20 = \\
O &: -16 + 18 = \\
T &: 1 - 12 = \\
A &: 4 - -22 = \\
F &: -4 - 10 = \\
O &: 31 - -6 = \\
A &: -3 + 15 = \\
T &: -4 + -25 = \\
P &: 37 - 12 = \\
O &: 17 - 18 = \\
S &: 10 + -2 = \\
E &: -11 - -4 = \\
U &: -30 - 20 = \\
O &: -1 - -8 = \\
T &: -17 + 2 = \\
N &: 22 + -9 = \\
R &: -20 - -8 = \\
U &: -32 + 35 = \\
F &: 60 - -15 = \\
J &: 10 + 6 = \\
D &: -5 - -20 = \\
H &: 4 - 14 = \\
T &: 12 + -6 = \\
S &: -30 - 13 = \\
I &: -8 - -9 = \\
O &: -18 - -5 = \\
P &: 14 + -3 = \\
F &: 15 - -45 = \\
R &: -7 + 1 = \\
J &: -32 + -32 = \\
M &: -1 - -20 = \\
W &: 5 + -25 = \\
N &: 16 + -12 = \\
R &: -48 + 43 = \\
M &: 2 - 10 = \\
T &: -6 + 15 = \\
R &: -69 - -69 = \\
G &: 50 + -53 = 
\end{align*}
\]
# DAFFYNITION DECODER

<table>
<thead>
<tr>
<th>TWIN:</th>
<th>-980  -7  5181  476  -7  534  19  542  73  -115  476  -382</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARROT JUICE:</td>
<td>-254  476  19  542  534  -129  -7  -980  -607</td>
</tr>
<tr>
<td>MALE SURFER:</td>
<td>60  476  -7  -129  633  542  19  -444  -129  476  19  -589</td>
</tr>
</tbody>
</table>

## TO DECODE THESE THREE DAFFYNITIONS, FOLLOW THESE DIRECTIONS:

Work any problem below and find your answer in the code. Each time the answer appears in the code, write the letter of that problem above it.

**KEEP WORKING AND YOU WILL DECODE DEFINE PRINT.**

<table>
<thead>
<tr>
<th>L</th>
<th>-78 + -37 =</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-562 - 45 =</td>
</tr>
<tr>
<td>E</td>
<td>-81 - -623 =</td>
</tr>
<tr>
<td>V</td>
<td>762 + -129 =</td>
</tr>
<tr>
<td>Y</td>
<td>17 - 399 =</td>
</tr>
<tr>
<td>D</td>
<td>-808 + 219 =</td>
</tr>
<tr>
<td>T</td>
<td>445 - -89 =</td>
</tr>
<tr>
<td>B</td>
<td>356 + -800 =</td>
</tr>
<tr>
<td>I</td>
<td>-490 + -490 =</td>
</tr>
<tr>
<td>H</td>
<td>671 - 925 =</td>
</tr>
</tbody>
</table>

---

| P | Horatio Hornswoggle was born: 57 B.C.  
Horatio Hornswoggle died: 16 A.D.  
How old was Horatio when he died? _______ years |
|---|--------------------------------------------------------------------------------------|
| O | Bank account balance: $357.  
Check written for: $486.  
What was the new balance? $_____ |
| F | Altitude of mountain climber: 4572 meters.  
Altitude of submarine commander: -609 meters.  
What is the difference in these altitudes? _______ meters |
| A | The Roman Republic was established: 509 B.C.  
The Roman Empire fell 985 years later.  
In what year did the Empire fall? _______ A.D. |
| R | Altitude of scuba diver: -12 meters.  
Altitude of shark: -31 meters.  
What is the difference in these altitudes? _______ meters |
| N | Temperature at 8:00 A.M.: -15°C.  
Temperature rose 8°C during the next hour. What was the temperature at 9:00 A.M.? _______ °C |

---

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**FIND A MATCH**

**DIRECTIONS:**
Each of the two blocks below is divided into 12 boxes containing exercises. Find two exercises, one in the top block and one in the bottom block, that have the same answer. Each time you find two exercises with the same answer, transfer the word from the top box to the corresponding bottom box. Keep working and you will spell out a message.

<table>
<thead>
<tr>
<th>-8 + 4 - -9 = TRYING</th>
<th>10 - 14 + -8 = SOME</th>
<th>-5 - -7 + -5 = IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>-8 + -1 + -20 + -3 = ARE</td>
<td>2 - 17 + 21 - -1 = TO</td>
<td>-4 - -4 + 8 - 8 = A</td>
</tr>
<tr>
<td>-1 + -1 - -1 + 1 - -1 = DOUGH</td>
<td>-70 + 90 + -50 = MAKE</td>
<td>-7 - -7 + 7 - -7 = BAKERS</td>
</tr>
<tr>
<td>9 + -16 - -8 + 11 = FORTUNE</td>
<td>17 - -2 + -20 - 6 = PRETZEL</td>
<td>-25 + -75 - -50 = CROOKED</td>
</tr>
<tr>
<td>-30 + 15 - -9 - 6 =</td>
<td>5 - -4 + 9 - 25 =</td>
<td>-29 + 39 + -7 - -11 =</td>
</tr>
<tr>
<td>40 - 80 - -15 + -7 =</td>
<td>6 - -2 - 19 + 16 =</td>
<td>-14 + 44 + -23 =</td>
</tr>
<tr>
<td>24 + -48 + -12 + 6 =</td>
<td>48 + -16 + -16 + -16 =</td>
<td>32 - 35 - -5 + 10 =</td>
</tr>
<tr>
<td>-3 - -13 - 10 - 3 =</td>
<td>-30 + 40 - 50 + -10 =</td>
<td>15 + -6 - 13 + 5 =</td>
</tr>
</tbody>
</table>
What did the purple shovel say to the pink hoe?

DIRECTIONS: The answer to the title question is hidden in the rectangle. To find it, do the exercises below and find your answers in the rectangle. Shade in each area containing a correct answer.

MULTIPLY

1. $(6)(-6) =$
2. $(-8)(8) =$
3. $(57)(-9) =$
4. $(-20)(45) =$
5. $(38)(-70) =$
6. $(-35)(16) =$
7. $(87)(-79) =$
8. $(53)(41) =$
9. $(25)(-25) =$
10. $(9)(-9)(10) =$
11. $(-15)(15)(15) =$
12. $(13)(27)(-7) =$
13. $(-24)(36)(2) =$
14. $(50)(3)(50) =$
15. $(98)(8)(-1) =$
16. $(-471)(8) =$
17. $(-57)(396) =$
18. $(439)(-876)(0) =$
FAMOUS FARMING EXPRESSION

The multiplication table below contains 42 mistakes. Shade in each box that contains a mistake. Please use pencil so you can erase if necessary.

YOU WILL END UP WITH A FAMOUS FARMING EXPRESSION!

<table>
<thead>
<tr>
<th>X</th>
<th>2</th>
<th>-4</th>
<th>-9</th>
<th>6</th>
<th>3</th>
<th>8</th>
<th>-1</th>
<th>4</th>
<th>-8</th>
<th>-2</th>
<th>6</th>
<th>7</th>
<th>-5</th>
<th>9</th>
<th>-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>6</td>
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<td>18</td>
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<td>-18</td>
<td>-36</td>
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<td>63</td>
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<td>30</td>
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<td>10</td>
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<td>35</td>
<td>25</td>
<td>45</td>
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</tr>
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<td>14</td>
<td>-28</td>
<td>-63</td>
<td>42</td>
<td>21</td>
<td>-56</td>
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<td>14</td>
<td>-42</td>
<td>-49</td>
<td>35</td>
<td>63</td>
<td>49</td>
</tr>
</tbody>
</table>
HIDDEN MESSAGE

FIRST, do each exercise and find your answer in the rectangle below. The correct answers run across from left to right.
SECOND, shade in the boxes containing each correct answer.
When you finish, there will be 27 boxes not shaded in.

STARTING ON THE TOP LINE AND WORKING FROM LEFT TO RIGHT, PRINT THE 27 LETTERS THAT REMAIN INTO THE BOXES AT THE BOTTOM OF THE PAGE. A HIDDEN MESSAGE WILL APPEAR!

\[1 \ (-48) \ (-17) = \ \ \ \ 5 \ (-15) \ (-25) \ (-35) = \ \ \ \ 9 \ (-8) \ (-8) \ (-8) \ (-8) = \]
\[2 \ (39) \ (-68) = \ \ \ \ 6 \ (-100) \ (9) \ (53) = \ \ \ \ 10 \ (-498) \ (10) \ (20) \ (30) = \]
\[3 \ (-8) \ (4) \ (-7) = \ \ \ \ 7 \ (-3) \ (8) \ (-9) \ (-7) = \ \ \ \ 11 \ (-3) \ (-3) \ (-3) \ (-3) \ (-3) = \]

\[\begin{array}{cccccccccccccccccccccccc}
-1 & 8 & 1 & 6 & 4 & 2 & 9 & 8 & 8 & 0 & 0 & 0 & 3 & 9 & -1 & 5 & 1 & 2 & -1 & 7 & 2 & 2 & 4 & 0 & 7 \\
O & B & E & Y & L & I & A & T & T & E & N & T & I & O & N & R & O & L & E & I & N & G & O & O & N \\
-9 & 3 & 6 & -2 & 6 & 5 & 2 & 4 & -1 & 0 & -1 & 3 & 1 & 2 & 5 & -8 & -2 & 4 & 3 & 4 & 4 & 0 & 9 & 6 & 7 \\
T & H & A & T & O & T & E & L & O & P & H & Q & U & B & O & N & G & R & E & A & T & A & S & U & N \\
-3 & 2 & -9 & 5 & 3 & 4 & 9 & 4 & -3 & 1 & 4 & 6 & 6 & 4 & 0 & 5 & -6 & 0 & -4 & 7 & 7 & 0 & 0 & 4 & 3 \\
\end{array}\]
LOVE STORY

YOU PROBABLY HEARD ABOUT THE GUY WHO MET A GIRL, WHILE DRIVING HIS STEAM ROLLER AND GOT A CRUSH ON HER. HERE IS ANOTHER TOUCHING, TENDER, ROMANTIC LOVE STORY. TO DECODE IT:

Do any exercise below and find your answer in the coded LOVE STORY at the bottom of the page. Each time the answer appears in the code, write the letter of that exercise above it. Keep working and you will decode the LOVE STORY. You'll love it!

<table>
<thead>
<tr>
<th>O</th>
<th>(-5)(24) =</th>
<th>H</th>
<th>(14)(-14) =</th>
<th>L</th>
<th>(-70)(-20) =</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>-13 + 28 =</td>
<td>C</td>
<td>10 + -200 =</td>
<td>M</td>
<td>-145 - -75 =</td>
</tr>
<tr>
<td>W</td>
<td>-34 + -3 =</td>
<td>Y</td>
<td>-17 - -67 =</td>
<td>U</td>
<td>-275 + -350 =</td>
</tr>
<tr>
<td>G</td>
<td>(-10)(-13) =</td>
<td>A</td>
<td>(-16)(-400) =</td>
<td>T</td>
<td>(30)(-30) =</td>
</tr>
<tr>
<td>D</td>
<td>18 - -12 =</td>
<td>E</td>
<td>87 - -23 =</td>
<td></td>
<td>-99 - 65 =</td>
</tr>
<tr>
<td>R</td>
<td>-7 - 99 =</td>
<td>I</td>
<td>-69 + 37 =</td>
<td>S</td>
<td>600 + -475 =</td>
</tr>
</tbody>
</table>

LOVE STORY TITLE: A PRESSING ENGAGEMENT


125 110 6400 -70 110 30 15 -32 -190 110 6400 15 30 125 -625 -32 -900 110 30 -70 110


What did ZORNA say about marrying a shorter man?

Do any exercise below and find your answer in one of the boxes at the bottom of the page. Write the letter of the exercise in that box. The answers are arranged in order from smallest to largest. Keep working and you will discover the answer to the title question.

Exercises:

- E \[ \frac{36}{2} \]
- D \[ \frac{-50}{-2} \]
- A \[ \frac{100}{-4} \]
- D \[ \frac{-670}{-10} \]
- E \[ \frac{9100}{-100} \]
- S \[ \frac{-45}{3} \]
- A \[ \frac{600}{4} \]

Answers:

- A \[ -12 \div 4 = \]
- E \[ 60 \div 15 = \]
- T \[ 45 \div -9 = \]
- A \[ -48 \div -4 = \]
- R \[ -49 \div -7 = \]
- A \[ -3 \div -3 = \]
- E \[ -60 \div 5 = \]
- O \[ -200 \div 4 = \]
- A \[ -90 \div 9 = \]
- H \[ 0 \div -7 = \]
- D \[ 77 \div -7 = \]
- E \[ -215 \div 1 = \]
- T \[ 96 \div 12 = \]
- E \[ -75 \div -5 = \]
- O \[ 56 \div -8 = \]

Tasks:

- V \[ \frac{39}{3} = \]
- O \[ \frac{-54}{-6} = \]
- L \[ \frac{311}{1} = \]
- N \[ \frac{38}{-19} = \]
- V \[ \frac{-63}{3} = \]
- T \[ \frac{300}{-2} = \]
- H \[ \frac{1000}{100} = \]
- B \[ \frac{3110}{-10} = \]
- N \[ \frac{900}{300} = \]
- S \[ \frac{81}{-9} = \]
- L \[ \frac{-430}{-2} = \]
- H \[ \frac{-48}{6} = \]
- L \[ \frac{-48}{3} = \]
- T \[ \frac{-91}{-1} = \]
## Did you hear about...

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>-436</td>
<td>IN</td>
<td></td>
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</tr>
<tr>
<td>29</td>
<td>THE</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>-46</td>
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<td></td>
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</tr>
<tr>
<td>-124</td>
<td>THAT</td>
<td></td>
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<td>FRIEND</td>
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<td></td>
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<td>UNHAPPY</td>
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<tr>
<td>639</td>
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<td>505</td>
<td>AT</td>
<td></td>
<td></td>
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<td>BUT</td>
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<td></td>
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<td>0</td>
<td>AND</td>
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<td>D</td>
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<td></td>
</tr>
<tr>
<td>46</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DIRECTIONS:** Divide to simplify any expression below and find your answer in one of the answer columns. Notice the word next to the answer. Write this word in the box that has the same letter as the exercise.

**KEEP WORKING AND YOU WILL HEAR ABOUT A MIST-AKE.**

-79 — HUG
-324 — WIFE
503 — TO
12 — THE
-127 — WHO
637 — A
202 — TRIED
-435 — BUT
-6000 — FOG
-321 — GIRL
-743 — LOST
-45 — GUY
203 — HELPED
Why did the ant run across the cracker box?

Do any exercise below and find your answer in the corresponding answer column. The letter of the exercise goes in the box that contains the number of the answer. Keep working and you will discover the answer to the title question.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Solution</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-15 + 7 =</td>
<td>23 7</td>
<td>2 -1</td>
</tr>
<tr>
<td>A 8 - 21 =</td>
<td>32 -27</td>
<td>4 3</td>
</tr>
<tr>
<td>D (3) (-9) =</td>
<td>28 50</td>
<td>10 -55</td>
</tr>
<tr>
<td>H -24 ÷ 4 =</td>
<td>13 -8</td>
<td>7 30</td>
</tr>
<tr>
<td>E -9 + 13 =</td>
<td>25 -6</td>
<td>12 -58</td>
</tr>
<tr>
<td>O (-2) (-25) =</td>
<td>36 -5</td>
<td>34 100</td>
</tr>
<tr>
<td>L -50 - 30 =</td>
<td>5 29</td>
<td>30 9</td>
</tr>
<tr>
<td>G -56 ÷ 8 =</td>
<td>8 -80</td>
<td>31 31</td>
</tr>
<tr>
<td>E 32 + 37 =</td>
<td>3 -22</td>
<td>21 -48</td>
</tr>
<tr>
<td>I -5 20 =</td>
<td>9 12</td>
<td>18 14</td>
</tr>
<tr>
<td>T 30 ÷ 2 =</td>
<td>11 -100</td>
<td>20 2</td>
</tr>
<tr>
<td>A -9 - 19 =</td>
<td>22 77</td>
<td>16 -9</td>
</tr>
<tr>
<td>N -7 -11 =</td>
<td>26 -14</td>
<td>35 -12</td>
</tr>
<tr>
<td>O -7 + 11 =</td>
<td>24 -15</td>
<td>6 -87</td>
</tr>
<tr>
<td>S -60 ÷ 5 =</td>
<td>1 -24</td>
<td>27 75</td>
</tr>
<tr>
<td>T 12 - 36 =</td>
<td>33 -26</td>
<td>15 72</td>
</tr>
<tr>
<td>E -17 - -3 =</td>
<td>14 -18</td>
<td>29 -10</td>
</tr>
<tr>
<td>L 260 ÷ -10 =</td>
<td>17 10</td>
<td>19 16</td>
</tr>
</tbody>
</table>
What did the BOY VOLCANO say to the GIRL VOLCANO?

To discover the romantic words of the Boy Volcano:

Do any exercise below and find your answer at the bottom of the page. Shade in the letter above each correct answer.

When you finish, the Boy Volcano's words will remain!

1. \(-178 + -345 = \)
2. \(-403 - -177 = \)
3. \((-397)(8) = \)
4. \(\frac{-2632}{-7} = \)
5. \(690 + -255 = \)
6. \(800 - -499 = \)
7. \((-56)(-90) = \)
8. \(\frac{-7080}{10} = \)
9. \(-83 + 24 + -19 = \)
10. \(-2094 - 67 = \)
11. \((-12)(-12)(-12) = \)
12. \(\frac{4956}{-84} = \)
13. \(-15 + 19 + -26 + 11 = \)
14. \(-232 - -508 = \)
15. \((-5)(6)(-7)(8) = \)
16. \(\frac{0}{-600} = \)
17. \(76 + -90 - -48 = \)
18. \(\left(\frac{-3768}{-6}\right)(-3) = \)

EVERY SMILE ADDS FACE VALUE!

1299 1884 1680 5040 45 613 2161 11 226 435 0 2480 376 -78 285 -1974 -708 -2976 -34 1728

Pre-Algebra with Pizzazz!

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JUMBLED JIGSAW

DIRECTIONS:
This puzzle provides practice in reducing fractions. First cut out the 25 square puzzle pieces below. Then arrange the pieces so that each fraction that can be reduced is next to its equivalent fraction in lowest terms.

When the pieces are properly arranged, the letters inside the pieces will form a special message!
ON THE BUTTON

HERE IS A BUTTON YOU CAN CUT OUT AND WEAR. TO DECODE THE BUTTON:
Solve any equation below and find your answer around the rim of the button.
Each time the answer appears on the button, write the letter in that equation above it.

KEEP SOLVING EQUATIONS AND YOU WILL DECODE THE BUTTON.

<table>
<thead>
<tr>
<th>(-\frac{1}{2}) = G</th>
<th>(\frac{2}{3}) = E</th>
<th>(-\frac{4}{5}) = D</th>
</tr>
</thead>
<tbody>
<tr>
<td>(G)</td>
<td>(E)</td>
<td>(D)</td>
</tr>
<tr>
<td>(-\frac{8}{9}) = (-\frac{16}{9})</td>
<td>(-\frac{5}{6}) = (-\frac{V}{18})</td>
<td>(-\frac{3}{4}) = (-\frac{18}{S})</td>
</tr>
<tr>
<td>(C)</td>
<td>(V)</td>
<td>(S)</td>
</tr>
<tr>
<td>(\frac{7}{12}) = \frac{1}{24})</td>
<td>(\frac{3}{N}) = \frac{1}{16})</td>
<td>(W) = (-\frac{3}{24}) = (-\frac{3}{8})</td>
</tr>
<tr>
<td>(I)</td>
<td>(N)</td>
<td>(W)</td>
</tr>
<tr>
<td>(-\frac{7}{10}) = (-\frac{35}{10})</td>
<td>(\frac{T}{28}) = \frac{4}{7})</td>
<td>(\frac{2}{15}) = \frac{4}{L})</td>
</tr>
<tr>
<td>(A)</td>
<td>(T)</td>
<td>(L)</td>
</tr>
<tr>
<td>(-\frac{7}{25}) = \frac{R}{100})</td>
<td>(-\frac{70}{O}) = (-\frac{7}{8})</td>
<td>(\frac{5}{12}) = \frac{F}{60})</td>
</tr>
<tr>
<td>(R)</td>
<td>(O)</td>
<td>(F)</td>
</tr>
</tbody>
</table>
1. What do you get when you cross A HUNTING DOG WITH A TELEPHONE?

2. What do you get when you cross A MOTORCYCLE WITH A JOKE BOOK?

3. What do you get when you cross FIVE PIGS AND FIVE DEER?

TO DECODE THE ANSWERS TO THESE THREE QUESTIONS:
Do any exercise below and find your answer in the code. Each time the answer appears in the code, write the letter of that exercise above it.

KEEP WORKING AND YOU WILL DISCOVER WHAT YOU GET FROM EACH DOUBLE CROSS!

D \[ \frac{2}{3} + \frac{-1}{4} = \]

I \[ \frac{-4}{5} + \frac{1}{2} = \]

O \[ \frac{-1}{3} + \frac{-7}{8} = \]

M \[ \frac{-4}{5} + \frac{3}{4} = \]

U \[ \frac{-1}{5} + \frac{-2}{3} = \]

T \[ \frac{5}{6} + \frac{-7}{12} = \]

R \[ \frac{-3}{4} + \frac{5}{6} = \]

W \[ \frac{-9}{10} + \frac{-1}{6} = \]

K \[ \frac{-1}{4} + \frac{7}{9} = \]

V \[ \frac{11}{15} + \frac{-2}{5} = \]

N \[ \frac{-11}{12} + \frac{5}{8} = \]

Y \[ \frac{2}{3} + \frac{-1}{16} = \]

C \[ \frac{-4}{9} + \frac{1}{2} = \]

G \[ \frac{-3}{4} + \frac{7}{12} = \]

B \[ \frac{-3}{5} + \frac{-3}{8} = \]

L \[ \frac{3}{10} + \frac{37}{100} = \]

E \[ \frac{3}{10} + \frac{-13}{15} = \]

H \[ \frac{-1}{8} + \frac{5}{6} = \]

A \[ \frac{-1}{6} + \frac{-2}{9} = \]

S \[ \frac{-1}{4} + \frac{7}{10} = \]
**SUM CODE**

Do any exercise below and find your answer in the answer columns. Notice the number in front of the answer. Each time this number appears in the code, write the letter of the exercise above it. Keep working and you will decode the message.

<table>
<thead>
<tr>
<th>S</th>
<th>-1 1/4 + -2 1/2 =</th>
<th>N</th>
<th>4 2/9 + -9 1/2 =</th>
<th>1</th>
<th>-1 7/24</th>
<th>10</th>
<th>-1 1/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>-3 2/3 + -1 2/5 =</td>
<td>W</td>
<td>-8 3/4 + 1 2/5 =</td>
<td>2</td>
<td>-5 1/15</td>
<td>11</td>
<td>5/12</td>
</tr>
<tr>
<td>A</td>
<td>4 1/2 + -2 1/3 =</td>
<td>C</td>
<td>3 1/4 + -5 7/9 =</td>
<td>3</td>
<td>-7 9/20</td>
<td>12</td>
<td>4 8/15</td>
</tr>
<tr>
<td>F</td>
<td>3 1/6 + -5 3/5 =</td>
<td>G</td>
<td>6 8/11 + 2 2/3 =</td>
<td>4</td>
<td>-6 3/40</td>
<td>13</td>
<td>-1 1/2</td>
</tr>
<tr>
<td>U</td>
<td>-8 3/4 + 1 3/10 =</td>
<td>I</td>
<td>5 5/6 + -5 8/9 =</td>
<td>5</td>
<td>-5 5/18</td>
<td>14</td>
<td>-3 3/4</td>
</tr>
<tr>
<td>T</td>
<td>-7 1/3 + 7 3/4 =</td>
<td>H</td>
<td>-3 4/5 + 2 3/10 =</td>
<td>6</td>
<td>9 13/33</td>
<td>15</td>
<td>-4 19/48</td>
</tr>
<tr>
<td>M</td>
<td>-2 1/16 + -2 1/3 =</td>
<td>R</td>
<td>8 3/8 + -9 2/3 =</td>
<td>7</td>
<td>0</td>
<td>16</td>
<td>-7 7/20</td>
</tr>
<tr>
<td>L</td>
<td>6 3/7 + -4 1/4 =</td>
<td>E</td>
<td>-4 1/5 + -1 7/8 =</td>
<td>8</td>
<td>-2 13/30</td>
<td>17</td>
<td>2 1/6</td>
</tr>
<tr>
<td>D</td>
<td>-1 1/6 + 5 7/10 =</td>
<td>B</td>
<td>-7 3/8 + 7 3/8 =</td>
<td>9</td>
<td>2 5/28</td>
<td>18</td>
<td>-9 1/36</td>
</tr>
</tbody>
</table>

17·7·4·17·1·15·3·14·11·7·4·16·17·1·4·16·13·4·5·9·2·14·10·5·6

13·10·14·13·17·10·1·7·4·18·17·3·14·4·17·8·11·4·1·17·9·9·13·2·16

15·3·18·13·18·2·9·12·17·10·1·18·17·5·17·7·17·1·4·7·4·17·1·7·4·17·1?
What do Hairdressers do?

Do the exercises below. Circle the answers and their letters. Then rearrange the circled letters in each grid to make a word. Write the words in order in the boxes at the bottom of the page.

WHEN YOU FINISH YOU WILL KNOW WHAT HAIRDRESSERS DO!

|    | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | E  | R  | Y  |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|    | $-2\frac{1}{4}$ | $6\frac{3}{4}$ | $-6\frac{2}{3}$ | $3\frac{2}{5}$ | $\frac{1}{6}$ | $-3\frac{1}{7}$ | $-2\frac{3}{4}$ | $-6\frac{1}{2}$ | $\frac{3}{5}$ | $4\frac{2}{3}$ | $-3\frac{1}{7}$ | $-2\frac{3}{4}$ | $-6\frac{7}{9}$ | $3\frac{2}{5}$ |
|    | $-4\frac{1}{3}$ | $-2\frac{4}{5}$ | $-8\frac{1}{5}$ | $-5\frac{5}{6}$ | $-6\frac{7}{8}$ | $-1\frac{2}{5}$ | $-9\frac{1}{10}$ | $-6\frac{7}{9}$ | $-4\frac{3}{8}$ |
| A  | $1\frac{1}{12}$ | $P$ | $-4\frac{1}{2}$ | $4\frac{1}{8}$ | $-1\frac{1}{6}$ | $-1\frac{7}{9}$ | $-7\frac{1}{4}$ | $-1\frac{5}{6}$ | $-2\frac{3}{5}$ |
| B  | $T$ | $9\frac{11}{20}$ | $S$ | $H$ | $I$ | $L$ | $T$ | $U$ | $R$ | $E$ | $D$ | $A$ | $L$ | $O$ | $F$ | $T$ | $B$ |
| C  | $H$ | $-6\frac{1}{2}$ | $7\frac{12}{12}$ | $1\frac{15}{15}$ | $2\frac{1}{15}$ | $-1\frac{13}{15}$ | $-1\frac{9}{10}$ | $-1\frac{8}{24}$ | $-1\frac{8}{24}$ |
| D  | $-8\frac{1}{9}$ | $-7\frac{10}{10}$ | $-6\frac{7}{24}$ | $-6\frac{7}{24}$ | $-6\frac{7}{24}$ | $-6\frac{7}{24}$ | $-6\frac{17}{24}$ | $-6\frac{17}{24}$ | $-6\frac{17}{24}$ |
| E  | $-4\frac{1}{3}$ | $-4\frac{1}{2}$ | $-4\frac{1}{3}$ | $-4\frac{1}{3}$ | $-4\frac{1}{3}$ | $-4\frac{1}{3}$ | $-4\frac{1}{3}$ | $-4\frac{1}{3}$ | $-4\frac{1}{3}$ |
| F  | $-3\frac{11}{20}$ | $-3\frac{10}{10}$ | $-3\frac{10}{10}$ | $-3\frac{10}{10}$ | $-3\frac{10}{10}$ | $-3\frac{10}{10}$ | $-3\frac{10}{10}$ | $-3\frac{10}{10}$ | $-3\frac{10}{10}$ |
| G  | $-4\frac{11}{24}$ | $O$ | $5\frac{7}{8}$ | $D$ | $5\frac{7}{24}$ | $5\frac{7}{24}$ | $5\frac{7}{24}$ | $5\frac{7}{24}$ | $5\frac{7}{24}$ |
| H  | $-4\frac{19}{35}$ | $U$ | $5\frac{1}{2}$ | $N$ | $-3\frac{13}{20}$ | $-3\frac{13}{20}$ | $-3\frac{13}{20}$ | $-3\frac{13}{20}$ | $-3\frac{13}{20}$ |
| I  | $S$ | $R$ | $A$ | $7\frac{27}{40}$ | $7\frac{12}{12}$ | $7\frac{12}{12}$ | $7\frac{12}{12}$ | $7\frac{12}{12}$ | $7\frac{12}{12}$ |
| J  | $E$ | $D$ | $7\frac{31}{40}$ | $5\frac{16}{16}$ | $5\frac{16}{16}$ | $5\frac{16}{16}$ | $5\frac{16}{16}$ | $5\frac{16}{16}$ | $5\frac{16}{16}$ |
| K  | $Y$ | $T$ | $B$ | $7\frac{1}{2}$ | $7\frac{1}{2}$ | $7\frac{1}{2}$ | $7\frac{1}{2}$ | $7\frac{1}{2}$ | $7\frac{1}{2}$ |

PRE-ALGEBRA WITH PIZZAZZ! © Creative Publications
Do the exercises below. Find your answers in the rectangle at the bottom of the page. Cross out each box containing a correct answer. When you finish, there will be 9 boxes not crossed out. Print the letters in these boxes in the bottom row of boxes.

A HIDDEN MESSAGE WILL APPEAR!

1. \(2\frac{2}{3} + -1\frac{1}{2} =\)
2. \(-5\frac{5}{6} - -2\frac{3}{5} =\)
3. \(-2\frac{1}{3} + -2\frac{3}{10} =\)
4. \(9\frac{1}{9} - \frac{5}{6} =\)
5. \(5\frac{3}{4} + 1\frac{11}{15} =\)
6. \(-\frac{7}{8} - 4\frac{4}{5} =\)
7. \(4\frac{1}{4} - -2\frac{2}{5} =\)
8. \(-7\frac{1}{8} + 4\frac{3}{4} =\)
9. \(1\frac{5}{6} - -3\frac{7}{8} =\)
10. \(7\frac{5}{12} + -7\frac{7}{8} =\)
11. \(4\frac{5}{8} + \frac{2}{3} =\)
12. \(-3\frac{1}{3} + -3\frac{5}{16} =\)
13. \(1\frac{1}{2} - 6\frac{7}{9} =\)
14. \(-2\frac{3}{4} - 6\frac{5}{9} =\)
15. \(-1\frac{3}{4} + 5\frac{1}{6} =\)
16. \(-4\frac{1}{2} - -6\frac{2}{5} =\)
17. \(1\frac{11}{15} + -5\frac{1}{2} =\)
18. \(-6 + 6\frac{1}{8} =\)

<table>
<thead>
<tr>
<th>CAR</th>
<th>PET</th>
<th>RAC</th>
<th>KET</th>
<th>ERS</th>
<th>KID</th>
<th>OGS</th>
<th>TOP</th>
<th>SWI</th>
</tr>
</thead>
<tbody>
<tr>
<td>-9\frac{11}{36}</td>
<td>6\frac{13}{20}</td>
<td>1\frac{8}{8}</td>
<td>-4\frac{19}{30}</td>
<td>-4\frac{23}{30}</td>
<td>3\frac{11}{12}</td>
<td>5\frac{7}{24}</td>
<td>7\frac{29}{60}</td>
<td>-9\frac{17}{36}</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>THM</th>
<th>NGT</th>
<th>ALL</th>
<th>UMP</th>
<th>IRE</th>
<th>STA</th>
<th>SHA</th>
<th>LLO</th>
<th>VEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5\frac{21}{40}</td>
<td>8\frac{5}{18}</td>
<td>-6\frac{31}{48}</td>
<td>-6\frac{37}{48}</td>
<td>-5\frac{27}{40}</td>
<td>1\frac{1}{6}</td>
<td>7\frac{37}{60}</td>
<td>5\frac{17}{24}</td>
<td>6\frac{9}{20}</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CUT</th>
<th>SWE</th>
<th>ETI</th>
<th>SFA</th>
<th>LLT</th>
<th>OST</th>
<th>ALL</th>
<th>IME</th>
<th>ING</th>
</tr>
</thead>
<tbody>
<tr>
<td>-11\frac{24}{24}</td>
<td>8\frac{1}{18}</td>
<td>-5\frac{5}{18}</td>
<td>-3\frac{7}{30}</td>
<td>-4\frac{11}{30}</td>
<td>3\frac{5}{12}</td>
<td>-2\frac{3}{8}</td>
<td>2\frac{3}{10}</td>
<td>1\frac{9}{10}</td>
</tr>
</tbody>
</table>
Do the problems below and on page 2. Find your answers in the maze on page 2. SHADE IN each room containing a correct answer.

Then find a path to the Treasure that goes only through rooms you have NOT shaded in. The words in those rooms will form an a-mazing message!

1. The temperature at 6:00 P.M. in Frostfrozen, Antarctica was $-37$°C. If the temperature dropped $8\frac{1}{2}$°C during the next hour, what was the temperature at 7:00 P.M.?

2. Cash O'recheck had a balance of $867 in his checking account on January 1. During January, Cash wrote checks for the following amounts: $98, $456, $29, and $381. What was his balance at the end of January?

3. Joe Terrific gained 986 yards during football season. Ziggy Fumble lost 118 yards during the season. What was the difference in their yardage gains?

4. The net profit for 4 months of Calculess Company is shown in the table. What was the net profit for the 4 month period?

<table>
<thead>
<tr>
<th>Month</th>
<th>Net Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan.</td>
<td>$34,500</td>
</tr>
<tr>
<td>Feb.</td>
<td>$15,600</td>
</tr>
<tr>
<td>Mar.</td>
<td>$-5,800</td>
</tr>
<tr>
<td>Apr.</td>
<td>$-20,000</td>
</tr>
</tbody>
</table>

5. A submarine was cruising at $-132$ meters. It then climbed to $-64\frac{1}{2}$ meters. What was the difference between its original altitude and its later altitude?

6. An elevator traveled in this way: up 18 floors, down 6 floors, down 14 floors, up 19 floors, down 25 floors. What was the net change in position of the elevator?

7. Astronauts Milky and Way boarded their spacecraft $4\frac{1}{2}$ hours before launch. They ate lunch $2\frac{1}{3}$ hours after launch. How many hours passed between boarding time and lunch time?

8. The Buzzards football team made the following gains on four plays: 9 yards, $-11$ yards, $-2\frac{2}{3}$ yards, $6\frac{1}{3}$ yards. What was the net change in position of the Buzzards as a result of the four plays?

9. On Monday, the temperature in Iceberg, North Pole was $-19$°C. On Tuesday, it rose $26\frac{1}{2}$°C. On Wednesday, it dropped $33\frac{1}{2}$°C. What was the temperature on Wednesday?

10. During a week, the stock of M.A.T.H. Corporation had the following daily changes in price: Monday, up 4 points; Tuesday, down 6 points; Wednesday, up $3\frac{1}{2}$ points; Thursday, up $1\frac{1}{4}$ points; Friday, down $\frac{5}{2}$ of a point. What was the net change in price of the stock for the week?
What is the distance \( x \) in the figure at the right?

\[
\begin{align*}
16 \frac{3}{10} \text{ cm} & \quad x \quad 38 \frac{1}{2} \text{ cm}
\end{align*}
\]

A cross-country skier started skiing at the 2000 meter level of a mountain. His altitude changed during the next four hours as follows: 1st hour, up 47 meters; 2nd hour, down 269 meters; 3rd hour, down 109 meters; 4th hour, up 54 meters. What was his altitude after the 4th hour?

One of two brothers was scuba diving at \(-9 \frac{1}{2}\) meters. The other brother was flying in a helicopter at 298 meters. What was the difference in the two brothers’ altitudes?

\[
\text{\$24,300 ENOUGH\, TREASURE\, \,-45 \frac{1}{2} ^\circ \mathrm{C}\, OFTEN}
\]

\[
\begin{align*}
\text{\,-8 KNOW} & \quad \text{\,-$86 IT}\quad \text{22}\frac{1}{5} \text{ cm}\quad \text{\,1}\frac{2}{3} \text{ yd}\quad \text{\,+2}\frac{7}{8} \text{ pt}\quad \text{\,-45}\frac{1}{2} ^\circ \mathrm{C} \quad \text{\,PIE}
\end{align*}
\]

\[
\begin{align*}
\text{\,-1\frac{1}{3} yd}\quad \text{\,-$97 THAT}\quad \text{\,304}\frac{1}{2} \text{ m}\quad \text{\,67}\frac{1}{2} \text{ m}\quad \text{\,EAT}
\end{align*}
\]

\[
\begin{align*}
\text{\,-4 THEY} & \quad \text{\,+2}\frac{1}{8} \text{ pt}\quad \text{\,-47}\frac{1}{2} ^\circ \mathrm{C}\quad \text{\,1634 m}\quad \text{\,NOT}\quad \text{\,$23,600 DO$
\end{align*}
\]

\[
\begin{align*}
\text{\,-22 ^\circ C}\quad \text{\,69}\frac{1}{2} \text{ m}\quad \text{\,2}\frac{1}{3} \text{ yd}\quad \text{\,1723 m}\quad \text{\,7}\frac{1}{3} \text{ hr}\quad \text{\,TEACHERS}
\end{align*}
\]

\[
\begin{align*}
\text{\,BECAUSE}\quad \text{\,STONE}\quad \text{\,IN}\quad \text{\,STATUES}\quad \text{\,2}\frac{2}{3} \text{ hr}\quad \text{\,SHOP}
\end{align*}
\]

\[
\begin{align*}
\text{\,1104 yd}\quad \text{\,307}\frac{1}{2} \text{ m}\quad \text{\,-26 ^\circ C}\quad \text{\,MANY}\quad \text{\,6}\frac{5}{6} \text{ hr}
\end{align*}
\]

\[
\begin{align*}
\text{\,FIGHT}\quad \text{\,MONSTERS}\quad \text{\,WORKING}\quad \text{\,A}
\end{align*}
\]

WRITE THE MESSAGE HERE:
What Happened to the Guy Who Wanted to be a Human Cannonball at the Circus?

Do each exercise mentally. Write the letter of the exercise in the box containing the number of the correct choice.

<table>
<thead>
<tr>
<th>N</th>
<th>1/5 + 2/5</th>
<th>I</th>
<th>1 - 1/10</th>
<th>E</th>
<th>1 - 1/100</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>1/5</td>
<td>13</td>
<td>1 1/10</td>
<td>17</td>
<td>99/100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E</th>
<th>1/5 - 2/5</th>
<th>H</th>
<th>-1 + 1/10</th>
<th>A</th>
<th>2 1/2 - 1 1/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1/5</td>
<td>15</td>
<td>-9/10</td>
<td>22</td>
<td>-1 1/10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>1 1/2 + 1/4</th>
<th>A</th>
<th>3/4 + 1/2</th>
<th>T</th>
<th>-1 + 1/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>1 3/4</td>
<td>8</td>
<td>2/3</td>
<td>29</td>
<td>1 1/4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E</th>
<th>-1 + 1/2</th>
<th>I</th>
<th>2 - 1/4</th>
<th>H</th>
<th>-4 + 1 3/5</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>-1 1/2</td>
<td>9</td>
<td>1 1/2</td>
<td>24</td>
<td>-2 3/5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th>2 1/2 + 2 1/2</th>
<th>E</th>
<th>1 - 9/10</th>
<th>S</th>
<th>6 - 1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>5</td>
<td>9</td>
<td>1/10</td>
<td>24</td>
<td>6 1/2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>3 + 1/8</th>
<th>H</th>
<th>1/10 - 1</th>
<th>M</th>
<th>7 25/25 + 18/25</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>3 1/8</td>
<td>26</td>
<td>-1 10/10</td>
<td>14</td>
<td>1/2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R</th>
<th>99/100 - 1</th>
<th>F</th>
<th>1 - 1 1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>100</td>
<td>20</td>
<td>1 2/14</td>
</tr>
</tbody>
</table>
What did the DENTIST say to the GOLFER?

SOME OF THE EXERCISES ON THIS PAGE HAVE THE SAME ANSWER. IN FACT, THERE ARE ONLY 6 DIFFERENT ANSWERS FOR ALL 17 EXERCISES. THESE 6 ANSWERS ARE PRINTED AT THE BOTTOM OF THE PAGE.

TO ANSWER THE TITLE QUESTION:

Do any exercise and find the answer at the bottom of the page. Write the letter of that exercise in ANY ONE of the boxes directly under its answer.

When you finish all the exercises, rearrange the letters in each group to make a word. Write the words in the BOTTOM row of boxes.

\[
\begin{align*}
N & \quad \frac{-4}{15} \cdot 9 = \\
O & \quad \frac{5}{9} \cdot -6 = \\
E & \quad \frac{7}{6} \cdot \frac{9}{14} = \\
O & \quad -3 \cdot \frac{2}{9} = \\
E & \quad \frac{10}{7} \cdot -\frac{7}{3} = \\
A & \quad \frac{8}{21} \cdot \frac{7}{20} = \\
E & \quad \frac{-7}{12} \cdot -10 =
\end{align*}
\]

\[
\begin{align*}
N & \quad \frac{-25}{9} \cdot \frac{-21}{10} = \\
A & \quad -5 \cdot \frac{-3}{20} = \\
I & \quad -6 \cdot \frac{2}{5} = \\
V & \quad \frac{11}{2} \cdot \frac{3}{22} = \\
U & \quad \frac{-8}{9} \cdot \frac{3}{4} = \\
L & \quad \frac{11}{6} \cdot \frac{-20}{11} = \\
O & \quad \frac{7}{2} \cdot \frac{5}{3} = \\
H & \quad \frac{-18}{5} \cdot \frac{25}{27} = \\
Y & \quad \frac{5}{12} \cdot -\frac{8}{5} = \\
H & \quad \frac{5}{6} \cdot \frac{5}{6} =
\end{align*}
\]
ABOVE ARE THE TITLES OF THREE "BOOKS NEVER WRITTEN." TO DECODE THE NAMES OF THEIR AUTHORS, FOLLOW THESE DIRECTIONS:

Use the DISTRIBUTIVE PROPERTY to do any exercise below. Find each circled answer in the code. Each time the answer appears, write the letter of that exercise above it. Keep working and you will decode the names of all three authors. Write on!

G 2\frac{1}{2} \cdot 6 = 12 + 3 =

A 8 \cdot 5\frac{1}{2} = 40 + _ =

F 3\frac{1}{2} \cdot 14 = _ + _ =

O 3 \cdot 4\frac{1}{3} = _ + _ =

E 6\frac{1}{3} \cdot 12 = _ + _ =

Y 10 \cdot 2\frac{1}{5} = _ + _ =

I 3\frac{1}{4} \cdot 24 = _ + _ =

W 9 \cdot 7\frac{2}{3} = _ + _ =

N 1\frac{3}{4} \cdot 20 = _ + _ =

H 8 \cdot 9\frac{5}{8} = _ + _ =

M 4\frac{5}{6} \cdot 18 = _ + _ =

L 15 \cdot 3\frac{3}{5} = _ + _ =

T 1\frac{7}{9} \cdot 36 = _ + _ =

D 16 \cdot 5\frac{7}{8} = _ + _ =

K 2\frac{7}{12} \cdot 24 = _ + _ =

S 40 \cdot 2\frac{3}{10} = _ + _ =

V There are 10 millimeters in 1 centimeter. How many millimeters are there in 8\frac{2}{5} centimeters?

U How many hours are there in 3\frac{2}{3} days?

C Zorna baked 7\frac{3}{4} dozen cookies. How many cookies did she bake?

R How many seconds are there in 1\frac{1}{2} minutes?
1. WHAT DID GEORGE WASHINGTON SAY TO HIS MEN JUST BEFORE THEY GOT IN THE BOAT?
Answer: "_____________________________"
\[
\begin{align*}
8 \frac{2}{5} & \quad 2 \frac{4}{7} & \quad -1 \frac{1}{16} & \quad -8 & \quad 2 \frac{4}{7} & \quad 9 \frac{4}{5} & \quad 8 \frac{1}{8} & \quad -1 \frac{1}{16} & \quad 9 \frac{4}{5} & \quad -3 \frac{1}{4} & \quad 2 \frac{4}{7} & \quad -1 \frac{2}{3} & \quad -25 & \quad 18 \frac{1}{5} & \quad 9 \frac{4}{5}
\end{align*}
\]

2. WHAT DID LEWIS AND CLARK SAY BEFORE THEY REACHED THE SEA?
Answer: "_____________________________"
\[
\begin{align*}
-24 & \quad -25 & \quad -1 \frac{1}{16} & \quad -8 & \quad 9 \frac{4}{5} & \quad 8 \frac{1}{8} & \quad 8 \frac{5}{7} & \quad 2 \frac{4}{7} & \quad -1 \frac{1}{16} & \quad -25 & \quad -7 \frac{1}{3} & \quad 2 \frac{4}{7} & \quad 18 \frac{1}{5}
\end{align*}
\]

3. WHAT DID BENJAMIN FRANKLIN SAY ABOUT DOING MATH?
Answer: "_____________________________"
\[
\begin{align*}
8 \frac{1}{8} & \quad 7 \frac{1}{3} & \quad -2 \frac{1}{10} & \quad 18 \frac{1}{5} & \quad 9 \frac{4}{5} & \quad -3 \frac{1}{4} & \quad 2 \frac{7}{4} & \quad -2 \frac{1}{10} & \quad -20 & \quad -24 & \quad 2 \frac{1}{4} & \quad 18 \frac{1}{5} & \quad 15 \frac{3}{4} & \quad 8 \frac{1}{8} & \quad 9 \frac{4}{5} & \quad 2 \frac{3}{7}
\end{align*}
\]

Do any exercise below and find your answer in the code. Each time the answer appears in the code, write the letter of that exercise above it. Keep working and you will discover the three historical (hysterical) answers.

\[
\begin{align*}
\text{H} & \quad \left(1 \frac{1}{4}\right) & \left(-2 \frac{3}{5}\right) = & \quad \text{B} & \quad \left(3 \frac{4}{7}\right) & \left(-7 \frac{15}{17}\right) = & \quad \text{A} & \quad \left(-3 \frac{1}{4}\right) & \left(-2 \frac{2}{5}\right) & \left(2 \frac{1}{3}\right) = \\
\text{G} & \quad \left(-1 \frac{5}{7}\right) & \left(4 \frac{2}{3}\right) = & \quad \text{R} & \quad \left(7 \frac{11}{17}\right) & \left(-3 \frac{3}{10}\right) = & \quad \text{L} & \quad \left(-1 \frac{5}{9}\right) & \left(-3\right) & \left(-5 \frac{1}{7}\right) = \\
\text{D} & \quad (-6) & (-1 \frac{2}{9}) = & \quad \text{K} & \quad \left(-2 \frac{1}{4}\right) & (-7) = & \quad \text{T} & \quad \left(4 \frac{1}{2}\right) & \left(5 \frac{3}{5}\right) & \left(7 \frac{18}{16}\right) = \\
\text{Y} & \quad \left(1 \frac{4}{17}\right) & \left(1 \frac{13}{20}\right) = & \quad \text{S} & \quad \left(-2 \frac{1}{2}\right) & \left(2 \frac{2}{3}\right) & \left(1 \frac{1}{10}\right) = & \quad \text{N} & \quad \left(4 \frac{1}{8}\right) & \left(1 \frac{6}{11}\right) = \\
\text{I} & \quad \left(-6 \frac{1}{2}\right) & \left(-1 \frac{1}{4}\right) = & \quad \text{M} & \quad (4) & \left(-1 \frac{4}{5}\right) & \left(-1 \frac{1}{6}\right) = & \quad \text{O} & \quad \left(-1 \frac{2}{3}\right) & \left(-3 \frac{3}{4}\right) & \left(-4\right) = \\
\text{F} & \quad \left(-2 \frac{1}{2}\right) & (8) = & \quad \text{E} & \quad \left(-2 \frac{1}{13}\right) & \left(3 \frac{5}{7}\right) & \left(-4 \frac{1}{2}\right) = \\
\end{align*}
\]
What is the Title of This Picture?

To decode the title of this picture:

Find the reciprocals of the given numbers in the first 12 exercises on the left.

Then do the remaining 6 exercises by solving each equation for \( n \).

After doing each exercise, find your answer in the code. Each time the answer appears, write the letter of that exercise above it. Keep working and you will discover the answer to the title question.

* * * * * * * * * * * * * * * * * * * *

Find the reciprocal

\[
\begin{align*}
L & : \frac{4}{5} \\
H & : -\frac{1}{2} \\
Y & : -\frac{3}{11} \\
M & : 12\frac{1}{2} \\
O & : -1\frac{7}{8} \\
E & : 10 \\
\end{align*}
\]

* Solve for \( n \)

\[
\begin{align*}
P & : 33\frac{1}{3} \\
G & : -\frac{1}{9} \\
K & : -3\frac{7}{12} \\
S & : 2\frac{3}{10} \\
C & : -1 \\
I & : -17\frac{3}{4} \\
\end{align*}
\]

* Coded title:

\[
\begin{align*}
10 & \quad 1 & \quad 3 & \quad -11 & \quad 3 & \quad -1 & \quad 5 & \quad 8 & \quad 2 & \quad 10 & \quad -11 \\
9 & \quad 10 & \quad 50 & \quad 3 & \quad 4 & \quad 37 & \quad 25 & \quad 23 & \quad 3 & \quad 3 \\
7 & \quad -4 & \quad -9 & \quad -2 & \quad 7 & \quad 3 & \quad -3 & \quad 3 & \quad 1 & \quad 10 \\
3 & \quad 71 & \quad -9 & \quad -2 & \quad 7 & \quad 3 & \quad -3 & \quad 3 & \quad 1 & \quad 10 \\
-5 & \quad -7 & \quad 5 & \quad -12 & \quad 1 & \quad 3 & \quad 50 & \quad 47 & \quad 4 & \quad 43 & \quad 10 & \quad 50 \\
\end{align*}
\]
Why did Ray Friar need to get an approval from Councilman Hugh before he could open a flower shop?

TO FIND THE ANSWER:
Do any exercise below and find your answer in the code at the bottom of the page. Each time the answer appears in the code, write the letter of that exercise above it. Keep working and you will discover the moral of the story.

<table>
<thead>
<tr>
<th>S</th>
<th>$\frac{-3}{7} \div \frac{1}{2} =$</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>$\frac{-4}{5} \div \frac{-4}{3} =$</td>
</tr>
<tr>
<td>Y</td>
<td>$\frac{5}{8} \div \frac{-7}{12} =$</td>
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<tr>
<td>A</td>
<td>$\frac{-15}{13} \div \frac{-10}{11} =$</td>
</tr>
<tr>
<td>E</td>
<td>$\frac{5}{6} \div \frac{-7}{8} =$</td>
</tr>
<tr>
<td>D</td>
<td>$\frac{-8}{9} \div 2 =$</td>
</tr>
<tr>
<td>T</td>
<td>$\frac{25}{3} \div \frac{15}{6} =$</td>
</tr>
<tr>
<td>G</td>
<td>$\frac{-7}{9} \div \frac{-21}{6} =$</td>
</tr>
<tr>
<td>I</td>
<td>$\frac{-11}{4} \div \frac{2}{3} =$</td>
</tr>
<tr>
<td>V</td>
<td>$\frac{-9}{10} \div \frac{-12}{5} =$</td>
</tr>
<tr>
<td>O</td>
<td>$3 \div \frac{-2}{3} =$</td>
</tr>
<tr>
<td>U</td>
<td>$\frac{4}{15} \div \frac{-14}{5} =$</td>
</tr>
<tr>
<td>N</td>
<td>$\frac{-7}{10} \div 7 =$</td>
</tr>
<tr>
<td>L</td>
<td>$\frac{11}{12} \div \frac{-33}{8} =$</td>
</tr>
<tr>
<td>P</td>
<td>$\frac{-45}{4} \div \frac{-15}{16} =$</td>
</tr>
<tr>
<td>H</td>
<td>$\frac{6}{20} \div \frac{7}{10} =$</td>
</tr>
<tr>
<td>R</td>
<td>$-10 \div \frac{-4}{7} =$</td>
</tr>
<tr>
<td>F</td>
<td>$\frac{-48}{9} \div \frac{16}{21} =$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
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<th>2</th>
<th>3</th>
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<td>21</td>
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<td>-6</td>
<td>10</td>
<td>-7</td>
<td>35</td>
<td>-33</td>
<td>33</td>
</tr>
</tbody>
</table>

Pre-Algebra with Pizzazz!
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Why did they build a GYM on WALL STREET?

TO ANSWER THIS QUESTION, FOLLOW THESE DIRECTIONS:
Do any exercise below and find your answer in the boxes at the bottom of the page. Write the letter of the exercise in the box above its correct answer. Keep working until you discover the answer to the title question.

\[
\begin{align*}
-3\frac{1}{2} \div 2\frac{1}{3} &= Y \\
-8 \div 1\frac{5}{7} &= O \\
-6\frac{1}{8} \div 7\frac{7}{9} &= C \\
4\frac{5}{7} \div -1\frac{4}{7} &= K \\
-5\frac{1}{4} \div -4\frac{3}{8} &= O \\
3 \div 3\frac{4}{5} &= O \\
\frac{3}{5} \div -1\frac{5}{7} &= F \\
-22\frac{1}{2} \div -15 &= T \\
6\frac{2}{3} \div -10 &= S \\
-1\frac{7}{9} \div -4\frac{4}{11} &= F \\
-10 \div -3\frac{1}{3} &= K \\
-1\frac{3}{4} \div 12\frac{1}{4} &= S \\
1\frac{5}{6} \div -3\frac{3}{10} &= E \\
3\frac{1}{6} \div -1\frac{3}{6} &= R \\
-7\frac{7}{8} \div 2\frac{7}{12} &= R \\
20 \div 1\frac{1}{2} &= B \\
\end{align*}
\]
What did the 800 lb MONSTER say to the 400 lb MONSTER??

TO DISCOVER THE WORDS OF THE 800 POUND MONSTER:

Do each exercise and find the answer at the bottom of the page. Shade in the letter above each correct answer. When you finish, the monster’s words will remain!

1. \[ \frac{-2}{3} + \frac{-4}{5} = \]
2. \[ \frac{1}{2} - \frac{7}{10} = \]
3. \[ \left( \frac{-6}{7} \right) \left( \frac{3}{8} \right) = \]
4. \[ \frac{-9}{10} \div \frac{-6}{15} = \]
5. \[ 1\frac{1}{4} + \frac{-3}{5} = \]
6. \[ -7 \frac{3}{10} - \frac{-4}{5} = \]
7. \[ \left( -\frac{15}{9} \right) \left( -\frac{21}{7} \right) = \]
8. \[ 5\frac{2}{3} \div \frac{-12}{15} = \]
9. \[ \frac{-2}{3} + 6\frac{1}{8} = \]
10. \[ -3\frac{2}{5} - \frac{-5}{6} = \]

11. \[ (6) \left( 1\frac{3}{10} \right) = \]
12. \[ -12 \div \frac{1}{3} = \]
13. \[ 2\frac{3}{4} + 2\frac{5}{9} = \]
14. \[ \frac{5}{8} - 5 = \]
15. \[ \left( \frac{3}{9} \right) \left( \frac{-9}{32} \right) = \]
16. \[ -3\frac{4}{7} \div \frac{-5}{8} = \]
17. \[ 8\frac{7}{10} + \frac{-4}{4} = \]
18. \[ \left( -\frac{2}{3} \right) \left( 1\frac{2}{5} \right) \left( -\frac{5}{7} \right) = \]
19. \[ 4\frac{3}{11} \div \frac{47}{11} = \]

G O O D M U S I C I S N O T E W O R T H Y

PRE-ALGEBRA WITH PIZZAZZ!
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Why did the TERMINITE like expensive hotels?

Do each exercise below and find the answer in the rectangle at the bottom of the page. Cross out each box containing a correct answer. When you finish, there will be 8 boxes not crossed out. Print the letters in these boxes in the bottom row of boxes.

THE ANSWER TO THE TITLE QUESTION WILL APPEAR!

1. A recipe calls for \(3\frac{3}{4}\) cups of flour. How much flour is needed to make \(\frac{1}{2}\) the recipe? \(\text{cups}\)

2. A team member played \(5\frac{3}{4}\) minutes during the first period, \(2\frac{1}{2}\) minutes during the second period, and \(10\frac{1}{2}\) minutes during the third period. How many minutes did he or she play in all? \(\text{minutes}\)

3. A \(3\frac{1}{2}\) gallon gas can contains \(\frac{9}{10}\) gallon. How much more gas can be poured in? \(\text{gallons}\)

4. A kilometer is about \(\frac{5}{8}\) mile. How many kilometers are in \(2\frac{3}{4}\) miles? \(\text{km}\)

5. A rectangular plot of land is \(1\frac{1}{2}\) miles wide by \(2\frac{4}{5}\) miles long. What is its area? \(\text{sq. mi.}\)

6. Stock sold at \(23\frac{7}{8}\) at the start of trading. It was up \(3\frac{1}{2}\) points at the end of trading. What was the price at the end of trading? \(\text{\$}\)

7. Cut \(2\frac{2}{3}\) yards of material from a piece \(5\frac{1}{2}\) yards long. How much material is left? \(\text{yards}\)

8. A bottle of TNT Tonic contains \(10\frac{1}{2}\) ounces and sells for \(98\) cents. What is the cost per ounce? \(\text{cents}\)

9. A team played 42 games and won \(\frac{5}{14}\) of them. How many games were lost?

10. UFO Industries makes \(\frac{1}{3}\) of the world's widgets. IOU Corporation makes \(\frac{2}{5}\) of the world's widgets. DDT Enterprises makes \(\frac{1}{6}\). What fraction is made by other companies?

11. A math textbook is \(1\frac{3}{8}\) inches thick. How many of these books will fit on a 33-inch shelf?

12. A rocket's speed is \(2\frac{4}{5}\) miles per second. How fast is this in miles per hour? \(\text{m.p.h.}\)
WHAT IS A FALSEHOLD?

TO ANSWER THIS QUESTION, FOLLOW THESE DIRECTIONS:

Fractions appear on two sides of the rectangle below, and their decimal equivalents appear on the other two sides. Draw a STRAIGHT LINE connecting each fraction to its decimal equivalent.

When you finish, you will notice that some areas in the rectangle contain an “S,” which stands for “shade.” Shade in all of these areas. The answer to the title question will appear!
Why is SPACE TRAVEL like a CHALKBOARD?

TO ANSWER THIS QUESTION, FOLLOW THESE DIRECTIONS:
Draw a straight line connecting each exercise with its correct answer. Each line will cross a number and a letter. The number tells you where to put the letter in the row of boxes at the bottom of the page.

6.4 + 3.2 • 4 • 2 • O • -6.4 • -4.4 • 6.9 • 16.25
5.9 - -1.3 • • • • • • • • • •
-8.5 + 2.1 • • • • • • • • • •
-14.8 - -5.6 • • • • • • • • • •
-3.7 + -0.7 • 12 • 17 • • • • • • • • • •
-8.04 - 0.13 • • • • • • • • • •
7.4 + -0.5 • • • • • • • • • •
1.4 - 2.6 • 5 • • • • • • • • • •
-10.6 + -9.1 • • • • • • • • • •
4 - -5.4 • • • • • • • • • •
-1.5 + 6 • 15 • 11 • • • • • • • • • •
3 - 4.7 • • • • • • • • • •
12.5 + 3.75 • • • • • • • • • •
-0.85 - 0.1 • 13 • 1 • • • • • • • • • •
-0.2 + 7.27 • • • • • • • • • •
-17 - -18.4 • 8 • • • • • • • • • •
1.01 + -0.9 • • • • • • • • • •

PRE-ALGEBRA WITH PIZZAZZ!
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HIDDEN MESSAGE

FIRST, do each exercise and find the answer in the rectangle below. The correct answers run across from left to right. SECOND, shade in the boxes containing each correct answer. When you finish, there will be 27 boxes not shaded in.

STARTING ON THE TOP LINE AND WORKING FROM LEFT TO RIGHT, PRINT THE 27 REMAINING LETTERS IN THE BOXES AT THE BOTTOM OF THE PAGE. A HIDDEN MESSAGE WILL APPEAR!

1. $-6.98 + 0.475 = \phantom{000000000} 5. 4 + -0.008 = \phantom{000000000} 9. -0.6 + -6 + -0.06 =$
2. $7.2 - 9.03 = \phantom{000000000} 6. -1.808 - 180.8 = \phantom{000000000} 10. 12 - 0.076 + -8.8 =$
3. $-6 + -2.17 = \phantom{000000000} 7. -0.003 + -7 = \phantom{000000000} 11. -0.7 + 0.02 - 3 =$
4. $-0.01 - -1.1 = \phantom{000000000} 8. 5.001 - 0.999 = \phantom{000000000} 12. -0.05 - -5 - 0.005 =$

\[
\begin{array}{cccccccccccc}
A & L & L & O & V & O & T & E & L & E & L & U & P & H & O & T & N & T \\
\hline
-7 & 0 & 0 & 3 & 4 & -1 & 3 & 1 & 2 & 4 & -5 & 6 & -6 & 5 & 0 & 5 & 0 & 7 \\
E & E & L & E & P & R & O & M & I & S & A & L & L & B & A & R & E & G \\
-4 & 3 & -1 & 8 & 3 & 7 & -6 & 6 & -1 & 9 & 4 & 9 & 4 & 5 & -3 & 0 & 7 \\
O & U & L & A & B & O & D & F & Y & E & S & T & E & R & O & B & O & T \\
2 & 3 & 9 & 2 & 4 & 6 & 7 & -1 & 8 & 2 & 6 & 0 & 8 & 5 & -3 & 6 & 8 \\
R & T & L & E & T & N & O & T & H & E & S & H & I & M & S & I & N & G \\
-1 & 4 & 0 & 2 & -3 & 7 & 7 & -8 & 1 & 7 & 4 & -1 & 1 & 0 & 9 & 7 & 1 \\
\end{array}
\]
THESE ARE CALLED CHAIN PROBLEMS. DO THE STEPS IN ORDER FROM LEFT TO RIGHT FOR EACH PROBLEM.

Do any exercise below and find your answer in the code at the bottom of the page. Each time the answer appears in the code, write the letter from the end of that exercise above the answer. Keep working and you will decode the message.

TAKE 24.8  ADD -8.7  SUBTRACT 13  =  =  W
TAKE -5.08  SUBTRACT -0.068  ADD 16.3  =  =  H
TAKE 15  ADD -2.7  ADD 0.04  ADD -12.3  =  =  N
TAKE -8.9  SUBTRACT -0.75  SUBTRACT 18  =  =  S
TAKE -17.1  ADD -0.007  SUBTRACT 4.9  =  =  V
TAKE 0.47  SUBTRACT 0.008  ADD -9  =  =  O
TAKE 68.707  ADD -99.999  ADD 32.592  =  =  A
TAKE -0.04  SUBTRACT -3  SUBTRACT 25.003  =  =  M
TAKE 7  SUBTRACT 14.1  ADD 23.471  =  =  K
TAKE -431.9  ADD -43.19  SUBTRACT 4.319  =  =  R
TAKE -0.01  ADD 0.1  ADD -1  ADD 10  =  =  T
TAKE 17.8  SUBTRACT -4.006  SUBTRACT 22  =  =  L
TAKE -37  ADD 46.98  SUBTRACT -0.02  =  =  E

-479.409  10  1.3  -0.194  10  -26.15  9.09  1.3  9.09  10
-22.043  10  0.04  11.288  1.3  -22.007  10  9.09  -8.538
16.371  0.04  -8.538  3.1  1.3  -0.194  -8.538  9.09
What has 12 HUMPS and lives at the NORTH POLE?

*** TO ANSWER THIS QUESTION: ***

Some of these exercises have a number and some have a letter. Find two exercises, one with a number and one with a letter, that have the SAME ANSWER. The number tells you where to put the letter in the row of boxes at the bottom of the page.

** KEEP WORKING AND YOU WILL DISCOVER THE ANSWER TO THE TITLE QUESTION. **

---

1. \((0.3)(-0.4) = \)  
2. \((-6)(-0.002) = \)  
3. \((0.01)(120) = \)  
4. \((-0.04)(0.03) = \)  
5. \((-0.04)(6) = \)  
6. \((-24)(-0.01) = \)  
7. \((8)(-0.003) = \)  
8. \((0.002)(12) = \)  
9. \((-0.06)(400) = \)  
10. \((0.4)(-5) = \)  
11. \((0.005)(0.04) = \)  
12. \((-200)(0.001) = \)  
13. \((-10)(-0.02) = \)  

---

** KEEP WORKING AND YOU WILL DISCOVER THE ANSWER TO THE TITLE QUESTION. **
**FIND A MATCH**

**DIRECTIONS:**
Each of the two blocks below is divided into 20 boxes. Boxes in the top block contain exercises and boxes in the bottom block contain their answers. Do the exercises and find your answers in the bottom block. Then write the word from the top box in the corresponding bottom box. Keep working and you will spell out a message.

<table>
<thead>
<tr>
<th></th>
<th>2.4(-0.39) IS</th>
<th>-0.87(-15) THE</th>
<th>-7.02(5.5) BECAUSE</th>
<th>-24.8(-0.03) A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(78)(-7.8) BEST</td>
<td>(-0.019)(9.4) ONLY</td>
<td>(-8.025)(-100) TO</td>
<td>(8.025)(1000) THE</td>
</tr>
<tr>
<td>5</td>
<td>(63.92)(-0.08) ON</td>
<td>(-0.39)(-27.6) OF</td>
<td>(-93)(0.555) POPULAR</td>
<td>(0.4)(0.4)(-0.4) THERE'S</td>
</tr>
<tr>
<td>9</td>
<td>(-1.5)(-15)(-0.15) THE</td>
<td>(-0.05)(0.8)(-3) PLACE</td>
<td>(3.4)(-9)(0.01) ONE</td>
<td>(7)(-0.593)(-0.1) VISIT</td>
</tr>
<tr>
<td>13</td>
<td>(-538.9)(-10) WEIGHT</td>
<td>(0.029)(-42) MOON</td>
<td>(-0.8)(45.46) RESTAURANT</td>
<td>(-0.01)(-0.1)(-1) SIXTH</td>
</tr>
<tr>
<td>17</td>
<td>8025</td>
<td>-608.4</td>
<td>0.12</td>
<td>802.5</td>
</tr>
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<td></td>
<td>0.744</td>
<td>-51.615</td>
<td>-36.368</td>
<td>-0.936</td>
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<td>-1.218</td>
<td>-38.61</td>
<td>-0.064</td>
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<td>-0.306</td>
<td>-0.001</td>
<td>10.764</td>
<td>13.05</td>
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</table>
How did the ANGEL lose his job?

Work any problem below and find your answer in the answer column. Notice the letter next to it. Print this letter in each box at the bottom of the page that contains the number of the exercise.

**KEEP WORKING AND YOU WILL DISCOVER THE ANSWER TO THE TITLE QUESTION.**

<table>
<thead>
<tr>
<th></th>
<th>Problem</th>
<th>Answer</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>(-13.5 + 2.75)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>(-4.8 - 7.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>((0.7)(-28.1))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>((-65)(0.005))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Absolute zero, the coldest possible temperature, is (-273.2^\circ C). Dry ice becomes a gas at (-78.5^\circ C). How many degrees above absolute zero is this?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>The U.S. Navy submarine Trieste II reached a record altitude of (-10.9) kilometers on January 23, 1960. A Russian MIG-25 jet reached a record altitude of 36.3 kilometers on July 25, 1973. What is the difference in these two altitudes?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>The highest priced diamond ever sold at auction weighed 69.42 carats and sold for $1,050,000. A carat is equal to 0.2 grams. What was the weight of this diamond in grams?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>In the 3 days after Jimmy Carter was elected President of the United States, the Dow Jones stock average had the following daily changes: Wednesday, (-9.56) points; Thursday, (+3.91) points; Friday, (-17.37) points. What was the net change for the three days?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>The 1937 Detroit football team holds the National Football League record for fewest penalties in a season. They received 19 penalties and gained an average (-7.3) yards per penalty. How many yards did they gain in all as a result of the penalties?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>The highest recorded temperature in the world was at Azizia, Libya, on September 13, 1922. The temperature was 58.0(^\circ)C. The lowest temperature, (-88.3^\circ)C, was recorded at the Soviet Antarctic station Vostok on August 24, 1960. What is the difference in these two temperatures?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When Do Super Heroes Use Decimals?

TO ANSWER THIS QUESTION:

Draw a straight line connecting each exercise with its correct answer. Each line will cross a number and a letter. The number tells you where to put the letter in the row of boxes at the bottom of the page.

4.8 × 100 • 8 H
0.48 × 10,000 • 16 U
480 ÷ 10 • 13 I
4.8 ÷ 1000 • 3 I
48 × 1000 • 17 T
0.0048 × 10 • 1 N
48,000 ÷ 10,000 • 7 O
48 ÷ 100 • 9 E
0.48 × 1,000,000 • 5 A
27.5 × 1000 • 11 S
2.75 ÷ 100 • 4 T
0.00275 ÷ 10 • 14 N
2.75 × 100,000 • 18 T
0.0275 × 100 • 2 T
2750 ÷ 1,000,000 • 6 A
27,500 ÷ 1000 • 10 S
0.275 × 10,000 • 12 T
27.5 × 10 • 15 E

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
1. SIGN IN ANTIQUE STORE:

\[
\begin{array}{cccccccccccccccccccc}
-4390 & 800 & -0.0079 & -379 & -0.2 & 0.04 & -70.9 & 3.7 & 68.037 & -275 & 800 & -70.9 & 800 & 800 & 0.04 \\
\end{array}
\]

2. SIGN ON WATERBED:

\[
\begin{array}{cccccccccccccccccccc}
-70.9 & 800 & -379 & -0.879 & 68.037 & -4390 & -5.008 & 68.037 & 4.39 & -4390 & -70.9 & 800 & 7.09 & -0.879 \\
\end{array}
\]

3. SIGN ON LAUNDRY TRUCK:

\[
\begin{array}{cccccccccccccccccccc}
0.083 & 800 & 7.09 & -0.2 & 6.556 & 800 & 68 & 7.09 & 68.037 & -3.7 & 2789.06 & 800 & -70.9 & 68 & -379 & 7.09 & 7.09 & -70.9 \\
\end{array}
\]

TO DECODE THESE THREE SIGNS: Do any exercise below and find your answer in the code. Each time the answer appears in the code, write the letter of that exercise above it. Keep working and you will decode all three signs. Enjoy the signery!

\[
\begin{array}{cccccccccccccccccccc}
1. & -0.6 \div 3 = & A & -2.274 \div 0.006 = & O & -34.0185 \div -0.5 = \\
N & -0.24 \div -6 = & W & -0.00332 \div -0.04 = & H & 5.57812 \div 0.002 = \\
F & 4.395 \div -5 = & C & -61.2 \div -0.9 = & E & -3.2 \div -0.004 = \\
K & -59.004 \div -9 = & Y & 0.35056 \div -0.07 = & M & -0.0237 \div 3 = \\
T & 2.96 \div -0.8 = & R & -439 \div 0.1 = & L & -6.381 \div -0.9 = \\
U & 0.3073 \div 0.07 = & B & 2.2 \div -0.008 = & S & 7090 \div -100 = \\
\end{array}
\]
When Did Porky Pig Lose His Pilot's License?

TO ANSWER THIS QUESTION:
Work all the problems below. Then arrange your answers from smallest (most negative) to largest (most positive) and write the letters of the problems in the boxes at the bottom of the page.

-358.4 =
64

-25.65 =
-95

-33.44 =
-1.9

0.03652 =
-0.44

-37.62 =
0.076

420.16 =
52

0.4806 =
-0.089

-0.9816 =
-24

13.158 =
-7.31

0.3978 =
-0.195

-0.27 =
0.0036

0.5672 =
-70.9

One sheet of paper is 0.0075 cm thick. How many sheets are there in a stack 2.7 cm high?

ANSWER: ____ sheets

One dose of medicine is 1.25 milliliters. How many doses are in a bottle containing 40 milliliters?

ANSWER: ____ doses

The ai or three-toed sloth travels at a speed of about 0.16 kilometer per hour. How long does it take to travel one kilometer at this speed?

ANSWER: ____ hours

A math book is 2.5 cm thick. How many of these books can be stored on a shelf that is one meter long?

ANSWER: ____ books
Why is an ELEPHANT big, gray, and wrinkled?

TO ANSWER THIS QUESTION:
Do the exercises below. Find your answers in the answer column. Notice the number in front of the answer. Each time this number appears in the code, write the letter of the exercise above it. Keep working and you will decode the answer to the question.

D  
\[-43.7 + 9.06 =\]

S  
\[-2.005 - 19.19 =\]

U  
\[-(8.6)(-0.07) =\]

E  
\[-36.75 ÷ 5 =\]

H  
\[-0.937 + -16.5 =\]

B  
\[4 - 20.95 =\]

F  
\[(98)(-0.44) =\]

O  
\[-53.36 ÷ -0.8 =\]

N  
\[75 + -9.606 =\]

W  
\[-14.88 - -20.88 =\]

L  
\[(-4308.1)(0.01) =\]

R  
\[0.24054 ÷ 0.006 =\]

T  
\[-0.49 + 49 - 4.9 =\]

A  
\[15.1 - -9.133 + -60 =\]

T  
\[(-0.8)(17)(-0.02) =\]

P  
\[203.75 ÷ -0.1 =\]

ANSWERS

1  40.09
2  -43.12
3  6
4  0.602
5  66.7
6  0.272
7  43.61
8  -7.35
9  -35.767
10 -34.64
11 -17.437
12 65.394
13 -2037.5
14 -21.195
15 -43.081
16 -16.95

CODED ANSWER

6 2 6 7 3 8 1 8 15 6 7 7 15 8 3 11 6 7 8 9 12 10

1 5 4 12 10 6 7 3 5 4 15 10 16 8 9 12 9 14 13 6 1 6 12
Mystery Question:
How can you be sure to wake up every morning with a smile?

The answer to this question is written in code at the bottom of the page. Use the clues given below to crack the code and find the answer.

\[
\begin{align*}
R &= 69.7 + (-41.75) \\
P &= (-8.5)(-0.04) \\
L &= R \times N \\
E &= W - O \\
U &= P \times I \\
I &= \frac{-0.5648}{0.008} \\
A &= R + O + G \\
N &= -19 + 19.1 \\
S &= T \times W \times Y \\
T &= R \div W \\
O &= -17.9 - 0.104 \\
M &= G \div N \\
W &= (0.005)(-86) \\
G &= O \div Y \\
H &= E - G \\
Y &= -0.028 \div 0.7
\end{align*}
\]

Coded Answer

\[
\begin{array}{cccccccccccc}
-1.118 & 2.795 & 17.574 & 17.574 & 0.34 & -0.43 & -70.6 & -65 & -432.526 \\
460.046 & -432.526 & 460.046 & 0.1 & 450.1 & 17.574 & 27.95 & -70.6 & 0.1 \\
-0.04 & -18.004 & -24.004 & 27.95 & 4501 & -18.004 & -24.004 & -65 & -432.526 \\
\end{array}
\]
**DIRECTIONS:** Solve each equation below and find the answer in the rectangle above. Shade in each area containing a correct answer.

**WHEN YOU FINISH, YOU WILL HAVE A PICTURE TITLED "ZERO." CAN YOU FIGURE OUT WHY???

<table>
<thead>
<tr>
<th>Equation</th>
<th>Solution</th>
<th>Equation</th>
<th>Solution</th>
<th>Equation</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>(67 + 0 = A)</td>
<td>(A = )</td>
<td>(\left(-15 \left( H - \frac{0}{2}\right) = 60)</td>
<td>(H = )</td>
<td>(P - (-37 \cdot 0) = -51)</td>
<td>(P = )</td>
</tr>
<tr>
<td>(-11 - 0 = B)</td>
<td>(B = )</td>
<td>(I - \frac{-45}{0} = 0)</td>
<td>(I = )</td>
<td>(92 - Q = 0)</td>
<td>(Q = )</td>
</tr>
<tr>
<td>(-8 \left(0 - 5\right) = C)</td>
<td>(C = )</td>
<td>(-78 + J = 0)</td>
<td>(J = )</td>
<td>(17 - R - 17 = -17)</td>
<td>(R = )</td>
</tr>
<tr>
<td>(-6 \left(7 + D\right) = -42)</td>
<td>(D = )</td>
<td>(-33 + K + 7 = 7)</td>
<td>(K = )</td>
<td>(\left(\frac{0}{-8 \cdot 5}\right) + S = -75)</td>
<td>(S = )</td>
</tr>
<tr>
<td>(\left(\frac{0}{9}\right) - 2 = E)</td>
<td>(E = )</td>
<td>(L + \left(\frac{0}{-5}\right) = -14)</td>
<td>(L = )</td>
<td>(-9 + T - \left(\frac{0}{8}\right) = 44)</td>
<td>(T = )</td>
</tr>
<tr>
<td>((-4 \cdot 8 \cdot 0) + F = -29)</td>
<td>(F = )</td>
<td>(M + \frac{-6}{\frac{0}{1}} = -9)</td>
<td>(M = )</td>
<td>(-37 - U = 0)</td>
<td>(U = )</td>
</tr>
<tr>
<td>(3 \left(0 - 16\right) = G)</td>
<td>(G = )</td>
<td>(\left(\frac{0}{9} \cdot 7\right) - \frac{-69}{N} = N)</td>
<td></td>
<td>(-95 - V - \frac{-6}{6} = 6)</td>
<td>(V = )</td>
</tr>
</tbody>
</table>
1. WHAT DO YOU CALL A STOLEN SAUSAGE?
   ANSWER: ____________
   45  1  -61  0  -9  84  84  -9  -8  -73  9  -9  -8  -45

2. WHAT HAPPENED TO THE HORSE WHO ATE ELECTRIC CABLES?
   ANSWER: ____________
   1  -61  -6  -61  -8  45  1  -28  14  -6  -9  2  -61

3. WHAT WAS THE TOW TRUCK DOING AT THE CAR RACE?
   ANSWER: ____________
   -98  -46  9  9  -9  -8  -73  -28  5  -28  84  45  7  -8  -61

TO DECODE THE ANSWERS TO THESE THREE IMPORTANT QUESTIONS:
Solve the equations below. Find the solutions in the code. Each time the
solution appears, write the letter in that equation above it. Keep working
and you will decode all three answers.

<table>
<thead>
<tr>
<th>A =</th>
<th>Y =</th>
<th>F =</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-28 \div 1)</td>
<td>(-1 \times \text{Y}) = (-14)</td>
<td>(-\frac{9}{5} \times \frac{F}{9}) = (-1)</td>
</tr>
<tr>
<td>K =</td>
<td>G =</td>
<td>W =</td>
</tr>
<tr>
<td>(K \div 1) = (-45)</td>
<td>(G \times -1) = 73</td>
<td>(-\frac{5}{6} \times \frac{W}{5}) = 1</td>
</tr>
<tr>
<td>T =</td>
<td>R =</td>
<td>W =</td>
</tr>
<tr>
<td>(T \div -1) = (-45)</td>
<td>(\frac{7}{7} + \frac{4}{4}) = R</td>
<td>(-98 \left(\frac{8}{N}\right)) = 98</td>
</tr>
<tr>
<td>O =</td>
<td>M =</td>
<td>N =</td>
</tr>
<tr>
<td>(-\frac{20}{-1} + \frac{13}{-1}) = O</td>
<td>(-\frac{13}{13} + \frac{43}{43}) = M</td>
<td>(-\frac{4}{7} \left(\frac{84}{5}\right)) = (-4)</td>
</tr>
<tr>
<td>U =</td>
<td>P =</td>
<td>S =</td>
</tr>
<tr>
<td>(\frac{29}{-1} + \frac{-17}{1}) = U</td>
<td>(\frac{1}{98} + \frac{-17}{17}) = (-2)</td>
<td>(\left(-\frac{1}{9}\right) \left(-\frac{52}{52}\right)) = (-1)</td>
</tr>
<tr>
<td>E =</td>
<td>H =</td>
<td>L =</td>
</tr>
<tr>
<td>(E \times 1) = (-61)</td>
<td>(\frac{3}{8} \times \frac{8}{3}) = H</td>
<td>(\left(-\frac{19}{19}\right) \left(\frac{L}{-1}\right)) = 9</td>
</tr>
</tbody>
</table>

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**GET THE MESSAGE**

**TRUE FALSE**

<table>
<thead>
<tr>
<th>Equation</th>
<th>TRUE</th>
<th>FALSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 + 96 = 96 + 48</td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>48 - 96 = 96 - 48</td>
<td>A</td>
<td>E</td>
</tr>
<tr>
<td>48 × 96 = 96 × 48</td>
<td>O</td>
<td>L</td>
</tr>
<tr>
<td>48 ÷ 96 = 96 ÷ 48</td>
<td>N</td>
<td>E</td>
</tr>
<tr>
<td>57 × (19 × 30) = 57 × (30 × 19)</td>
<td>V</td>
<td>C</td>
</tr>
<tr>
<td>(41 + 85) + 72 = (85 + 41) + 72</td>
<td>I</td>
<td>N</td>
</tr>
<tr>
<td>93 + (40 - 7) = 93 + (7 - 40)</td>
<td>N</td>
<td>L</td>
</tr>
<tr>
<td>(15 + 97) + 64 = 15 + (97 + 64)</td>
<td>E</td>
<td>I</td>
</tr>
<tr>
<td>25 × (59 × 36) = (25 × 59) × 36</td>
<td>S</td>
<td>E</td>
</tr>
<tr>
<td>100 ÷ (50 ÷ 25) = (100 ÷ 50) ÷ 25</td>
<td>P</td>
<td>T</td>
</tr>
<tr>
<td>(47 - 24) ÷ 11 = 47 - (24 - 11)</td>
<td>L</td>
<td>R</td>
</tr>
<tr>
<td>(80 - 4) × 69 = 80 × (4 - 69)</td>
<td>A</td>
<td>I</td>
</tr>
<tr>
<td>45 + (78 + 8) = 45 + (8 + 78)</td>
<td>R</td>
<td>A</td>
</tr>
<tr>
<td>27 + (29 + 94) = (27 + 29) + 94</td>
<td>E</td>
<td>P</td>
</tr>
<tr>
<td>33 × (64 + 20) = (33 × 64) + 20</td>
<td>F</td>
<td>E</td>
</tr>
<tr>
<td>(64 - 48) ÷ 16 = 64 - (48 ÷ 16)</td>
<td>F</td>
<td>A</td>
</tr>
<tr>
<td>(48 ÷ 24) × 12 = 48 × (24 ÷ 12)</td>
<td>U</td>
<td>T</td>
</tr>
<tr>
<td>(48 · 24) · 12 = 48 · (12 · 24)</td>
<td>A</td>
<td>E</td>
</tr>
<tr>
<td>48 + (24 + 12) = 12 + (48 + 24)</td>
<td>R</td>
<td>P</td>
</tr>
</tbody>
</table>

**FIRST PRINT THE LETTERS FROM THE “TRUE” COLUMN, THEN THOSE FROM THE “FALSE” COLUMN:**

---

**PRE-ALGEBRA WITH PIZZAZZ!** © Creative Publications
DIRECTIONS:
Figure out what number must replace any letter in these equations so that each equation illustrates the DISTRIBUTIVE PROPERTY. Write your answer in the box at the end of each row.

Then, find your answer in the code at the bottom of the page. Each time the answer appears in the code, write the letter in that equation above it.

KEEP WORKING AND YOU WILL DECODE THE LINE.

\[-4 (2 + 8) = (-4 \times 2) + (-4 \times N) \quad N = \]
\[15 (-7 + 5) = (15 \times Y) + (15 \times 5) \quad Y = \]
\[-34 (10 + -3) = (-34 \times 10) + (-34 \times A) \quad A = \]
\[7 (-6 + -5) = (7 \times G) + (7 \times -5) \quad G = \]
\[59 (12 + 9) = (59 \times 12) + (L \times 9) \quad L = \]
\[20 (-8 + 1) = (C \times -8) + (20 \times 1) \quad C = \]
\[-17 (-4 + -5) = (-17 \times -4) + (S \times -5) \quad S = \]
\[(6 \times 43) + (6 \times 19) = 6 (43 + H) \quad H = \]
\[(-7 \times 28) + (-7 \times 75) = -7 (28 + R) \quad R = \]
\[(8 \times -4) + (8 \times 18) = 8 (I + 18) \quad I = \]
\[(-6 \times 13) + (-6 \times 30) = -6 (W + 30) \quad W = \]
\[(-19 \times -8) + (-19 \times 52) = P (-8 + 52) \quad P = \]
\[(98 \times -2) + (98 \times -11) = E (-2 + -11) \quad E = \]
\[(50 \times 6) + (-31 \times 50) = T (6 + -31) \quad T = \]

TITLE: CURRENT EVENT

<table>
<thead>
<tr>
<th>98</th>
<th>59</th>
<th>98</th>
<th>20</th>
<th>50</th>
<th>75</th>
<th>-4</th>
<th>20</th>
<th>-4</th>
<th>50</th>
<th>-7</th>
<th>-4</th>
<th>-17</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>-3</td>
<td>50</td>
<td>50</td>
<td>-17</td>
<td>19</td>
<td>-3</td>
<td>-19</td>
<td>-19</td>
<td>98</td>
<td>8</td>
<td>-4</td>
<td>8</td>
</tr>
</tbody>
</table>
What is the Title of This Picture?

**CODED TITLE:**

-77 0 -2412 -2412 8330 -8000 8330 -77 -8000 2500 1425 -680 9577

2500 -2208 -2208 -680 -680 -4740 4050 9577 8330 -190

0 -4740 -2208 0 -660 -680 -77 0 -2412 -2412 8330 -8000 8330

**TO DECODE THE TITLE OF THIS PICTURE:**

Use the DISTRIBUTIVE PROPERTY to do any exercise below. Then find your answer in the coded title. Each time the answer appears in the code, write the letter of that exercise above it. Keep working and you will decode the title.

<table>
<thead>
<tr>
<th>A</th>
<th>(25 \times 43) + (25 \times 57) =</th>
<th>Y</th>
<th>(75 \times 8) + (75 \times -3) + (75 \times 14) =</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>(-17 \times 64) + (-17 \times -24) =</td>
<td>D</td>
<td>(49 \times -66) + (-72 \times -66) + (33 \times -66) =</td>
</tr>
<tr>
<td>F</td>
<td>(-90 \times -37) + (-90 \times -8) =</td>
<td>O</td>
<td>(-98 \times -15) + (-98 \times -55) + (-98 \times -15) =</td>
</tr>
<tr>
<td>R</td>
<td>(58 \times 61) + (99 \times 61) =</td>
<td>L</td>
<td>(-80 \times 19) + (43 \times -80) + (-80 \times 38) =</td>
</tr>
<tr>
<td>M</td>
<td>(-43 \times 19) + (33 \times 19) =</td>
<td>S</td>
<td>(-65 \times 24) + (13 \times 24) + (-40 \times 24) =</td>
</tr>
<tr>
<td>C</td>
<td>(-67 \times 86) + (-50 \times -67) =</td>
<td>I</td>
<td>(-52 \times 84) + (-52 \times -39) + (-45 \times -52) =</td>
</tr>
<tr>
<td>N</td>
<td>(-18 \times 79) + (79 \times -42) =</td>
<td>P</td>
<td>(77 \times -29) + (77 \times 77) + (-49 \times 77) =</td>
</tr>
</tbody>
</table>
1. How many triangles can you count in this picture?

2. Herman Horsetrader bought a horse for $600 and then sold it for $700. The next day he bought it back for $800 and then sold it for $900. How much money did Herman make altogether?

3. How many brothers and sisters are there in a family in which each boy has as many sisters as brothers but each girl has twice as many brothers as sisters?

4. Which of the four figures below should go in the empty box above?

5. Suppose a man offered to work for 30 days at the following salary: 1 cent for the first day, 2 cents for the second day, 4 cents for the third day, and so on, doubling each day. Would this salary be too much or too little for 30 days of work?

6. How many different 4-letter license plates can be made using only the letters M, A, T, and H? All four letters must be used on each plate.

7. It has been established that 1 of 4 men committed a crime. Following are the statements made by each suspect:
   - Harry: Barry did it.
   - Barry: Jerry did it.
   - Larry: I didn't do it.
   - Jerry: Barry lied when he said I did it.

   If ONLY ONE STATEMENT IS TRUE, who is the criminal?

8. Draw 2 straight lines across this clock face to divide it into 3 parts so that the numbers in each part add to 26.

9. The pattern below includes every letter of the alphabet except Z. Would Z go on the top or bottom row? Why?

   A B C D E F G H I J K L M N O P Q R S T U V W X Y

SCORING KEY

8 or 9 -- Superstar Genius
6 or 7 -- Star Genius
4 or 5 -- Genius
3 or less -- Genius of the Future
Can You Build This?

DIRECTIONS:
Figure out the value of each expression below and find it next to a dot. Connect the dots in the same order as the exercises are numbered. Be careful to lift your pencil and begin again each time you see the instruction "LIFT PENCIL."

YOU WILL CREATE AN INTERESTING STRUCTURE.
CAN YOU BUILD IT?

1. \((-4)^2\)
2. \((-3)^3\)
3. \((-6)^2\)
4. \((0.01)^2\)
5. \((-100)^2\)
6. \((-2)^3\)
7. \((0.5)^2\)
8. \((\frac{1}{5})^3\)
9. \((-10)^4\)
10. \((0.1)^2\)
11. \((-2)^6\)
12. \((-8)^1\)
13. \((\frac{6}{5})^3\)
14. \((0.3)^4\)
15. \((\frac{1}{8})^2\)

Lift Pencil
Stop
Write a fraction (or 1) for each power. For each set of exercises, there is one extra answer. Write the letter of this answer in the corresponding box at the right.

<table>
<thead>
<tr>
<th></th>
<th>Answers</th>
<th></th>
<th>Answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$7^{-2}$</td>
<td></td>
<td>$10^{-1}$</td>
</tr>
<tr>
<td>2-3</td>
<td>B $\frac{1}{9}$</td>
<td></td>
<td>20-2</td>
</tr>
<tr>
<td>3-2</td>
<td>L $\frac{1}{8}$</td>
<td></td>
<td>100-3</td>
</tr>
<tr>
<td>2</td>
<td>$10^{-4}$</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>4-3</td>
<td>G $\frac{1}{64}$</td>
<td></td>
<td>5-4</td>
</tr>
<tr>
<td>9-2</td>
<td>R $\frac{1}{27}$</td>
<td></td>
<td>150</td>
</tr>
<tr>
<td>3</td>
<td>$15^{-1}$</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>8-3</td>
<td>S $\frac{1}{40}$</td>
<td></td>
<td>10-5</td>
</tr>
<tr>
<td>2-5</td>
<td>P $\frac{1}{15}$</td>
<td></td>
<td>4-4</td>
</tr>
<tr>
<td>4</td>
<td>$5^{-3}$</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>3-4</td>
<td>H $\frac{1}{125}$</td>
<td></td>
<td>15-2</td>
</tr>
<tr>
<td>12-2</td>
<td>E $\frac{1}{96}$</td>
<td></td>
<td>110</td>
</tr>
<tr>
<td>5</td>
<td>$6^0$</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>1000-1</td>
<td>T $\frac{1}{1000}$</td>
<td></td>
<td>2-6</td>
</tr>
<tr>
<td>9-3</td>
<td>L 1</td>
<td></td>
<td>16-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>
Find the Message

Each row across has 5 rectangles. Only 3 of them contain TRUE equations. Circle these. 3 equations in each row.

Notice the number and letter above each equation you have circled. The number tells you where to put the letter in the boxes at the bottom of the page. You will spell out a six-word message.

<table>
<thead>
<tr>
<th>7-A</th>
<th>17-R</th>
<th>10-A</th>
<th>9-O</th>
<th>2-O</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^{-3} = \frac{1}{1000}$</td>
<td>$10^{-3} = 0.001$</td>
<td>$10^2 = \frac{1}{100}$</td>
<td>$10^{-3} = 0.01$</td>
<td>$10^{-2} = \frac{1}{10^2}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10-U</th>
<th>16-A</th>
<th>19-I</th>
<th>21-D</th>
<th>13-S</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^{-2} = 0.01$</td>
<td>$10^{-2} = \frac{1}{10}$</td>
<td>$10^0 = 1$</td>
<td>$10^{-4} = \frac{1}{10^4}$</td>
<td>$10^{-3} = 1000$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4-R</th>
<th>9-O</th>
<th>5-I</th>
<th>16-E</th>
<th>14-M</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^0 = 10$</td>
<td>$10^4 = 10,000$</td>
<td>$10^{-1} = \frac{1}{10}$</td>
<td>$10^{-2} = \frac{1}{100}$</td>
<td>$10^{-1} = 1$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13-E</th>
<th>15-H</th>
<th>6-S</th>
<th>12-B</th>
<th>4-L</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^{-1} = 0.1$</td>
<td>$10^1 = \frac{1}{10}$</td>
<td>$10^{-4} = 0.0001$</td>
<td>$10^{-3} = 0.0001$</td>
<td>$10^{-5} = \frac{1}{10^5}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14-T</th>
<th>11-R</th>
<th>8-P</th>
<th>15-T</th>
<th>20-E</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^2 = 100$</td>
<td>$10^{-3} = \frac{1}{10^3}$</td>
<td>$10^{-4} = \frac{1}{1000}$</td>
<td>$10^{-1} = \frac{1}{10^1}$</td>
<td>$10^0 = 0$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>18-H</th>
<th>12-L</th>
<th>20-R</th>
<th>3-O</th>
<th>8-F</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^2 = \frac{1}{100}$</td>
<td>$10^{-5} = 0.00001$</td>
<td>$10^{-1} = 0.1$</td>
<td>$10^{-2} = \frac{1}{10}$</td>
<td>$10^3 = 1000$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3-W</th>
<th>1-S</th>
<th>18-E</th>
<th>1-F</th>
<th>18-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^{-4} = \frac{1}{10,000}$</td>
<td>$10^3 = \frac{1}{1000}$</td>
<td>$10^1 = 0.1$</td>
<td>$10^{-2} = 0.01$</td>
<td>$10^1 = 10$</td>
</tr>
</tbody>
</table>

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
TO ANSWER THIS QUESTION: Express each product below as a single power of 10 or 8. Draw a straight line connecting each exercise with its answer. Each line will cross a number and a letter. The number tells you where to put the letter in the row of boxes at the bottom of the page.

\[
\begin{align*}
10^4 \cdot 10^3 & \quad \text{I} \\
10^{-4} \cdot 10^{-2} & \quad 8^3 \\
10^6 \cdot 10^{-2} & \quad 8^{-8} \\
8^{-4} \cdot 8^7 & \quad 8^{-12} \\
8^{-1} \cdot 8^{-2} & \quad 10^4 \\
8^{-5} \cdot 8^{-3} & \quad 1 \\
10^2 \cdot 10 & \quad 10^6 \\
10^{-2} \cdot 10^3 & \quad 8^{-1} \\
10^{-5} \cdot 10^5 & \quad 8^{-7} \\
8 \cdot 8^{-2} & \quad 10^{-7} \\
8^{-7} \cdot 8^{-5} & \quad 10^{-6} \\
8^{-6} \cdot 8^4 & \quad 8^{-2} \\
10^3 \cdot 10^3 & \quad 10 \\
10^{-8} \cdot 10 & \quad 8^2 \\
10^4 \cdot 10^{-9} & \quad 10^7 \\
8^{-6} \cdot 8^{-1} & \quad 8^7 \\
8 \cdot 8 & \quad 8^{-3} \\
8^4 \cdot 8^3 & \quad 10^{-5} \\
& \quad 10^3
\end{align*}
\]
How Did Slugger McFist Get A BLACK EYE?

TO ANSWER THIS QUESTION: Express any quotient below as a decimal numeral and find this numeral in the code key. Notice the letter next to it. Print this letter in the box at the bottom of the page that contains the exercise number. Keep working and you will discover the answer to the title question.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Expression</th>
<th>Code Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>( 10^5 \div 10^2 =)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>( 10^2 \div 10^5 =)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>( 10^{-6} \div 10^2 =)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>( 10^{-1} \div 10^{-3} =)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>( 10^2 \div 10^{-7} =)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>( 10^6 \div 10 =)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>( 10^{-3} \div 10^{-3} =)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>( \frac{10}{10^4} =)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>( \frac{10^{-5}}{10^5} =)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>( \frac{10^{10}}{10^{20}} =)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>( \frac{10}{10^{-1}} =)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>( \frac{10^{-2}}{10} =)</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>( \frac{10^{-8}}{10^{-9}} =)</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>( \frac{10^4}{10^{-3}} =)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>( \frac{10^{-5}}{10^3} =)</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>( \frac{10^4}{10^6} =)</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>( \frac{10^{-2}}{10^{-1}} =)</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>( \frac{10}{10^{-2}} =)</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>( \frac{10^3}{10^3} =)</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>( 10^{15} \div 10^{14} =)</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>( 10^{-5} \div 10 =)</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>( 10^{-7} \div 10^{-3} =)</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>( 10 \div 10^6 =)</td>
<td></td>
</tr>
</tbody>
</table>

CODE KEY

<table>
<thead>
<tr>
<th>Code</th>
<th>Letter</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0000000001</td>
<td>U</td>
</tr>
<tr>
<td>0.00000001</td>
<td>I</td>
</tr>
<tr>
<td>0.000001</td>
<td>C</td>
</tr>
<tr>
<td>0.0001</td>
<td>M</td>
</tr>
<tr>
<td>0.001</td>
<td>G</td>
</tr>
<tr>
<td>0.01</td>
<td>E</td>
</tr>
<tr>
<td>0.1</td>
<td>D</td>
</tr>
<tr>
<td>1</td>
<td>T</td>
</tr>
<tr>
<td>10</td>
<td>H</td>
</tr>
<tr>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>1000</td>
<td>S</td>
</tr>
<tr>
<td>10000</td>
<td>L</td>
</tr>
<tr>
<td>10000000</td>
<td>B</td>
</tr>
<tr>
<td>1000000000</td>
<td>Y</td>
</tr>
</tbody>
</table>
Daffynition Decoder

1. HAUNTED HOUSE:

\[
\begin{array}{cccccccccccc}
10^{-11} & 10^{-4} & 10^3 & 10^4 & 10^{-2} & 10^{-3} & 10^0 & 10^{-6} & 10^{-8} & 10^{-11} & 10^{-4} & 10^{-3} & 10^4 \\
\end{array}
\]

2. SUIT OF ARMOR:

\[
\begin{array}{cccccccccccc}
10^{-7} & 10^{-4} & 10^5 & 10^{-13} & 10^{-5} & 10^7 & 10^{-13} & 10^{-3} & 10^6 & 10^{-4} \\
\end{array}
\]

3. CENTIMETER:

\[
\begin{array}{cccccccccccc}
10^9 & 10^4 & 10^3 & 10^{-11} & 10^7 & 10^{-5} & 10^{-11} & 10^{-4} & 10^{-11} & 10^2 & 10^{12} & 10^{-1} & 10^3 & 10^4 \\
\end{array}
\]

TO DECODE THESE THREE DAFFYNITIONS:

Write any expression below as a single power of 10. Each time your answer appears in the code, write the letter of that exercise above it.

*KEEP WORKING AND YOU WILL DECODE THREE  DE-FUN-ITIONS.*

\[
\begin{align*}
W & \quad 10^{-2} \cdot 10^8 = \\
A & \quad 10^{-4} \cdot 10^{-7} = \\
I & \quad \frac{1}{1000} \cdot 10^8 = \\
Z & \quad 10 \cdot \frac{1}{100} = \\
O & \quad \frac{1}{10} \cdot \frac{1}{100} = \\
S & \quad \frac{1}{1,000,000} = \\
L & \quad 10^9 \div 10^7 = \\
H & \quad 10 \div 10^6 = \\
U & \quad \frac{10^{-2}}{10^{-2}} = \\
K & \quad \frac{1}{10,000} \div 1000 = \\
E & \quad \frac{1}{100} \div \frac{1}{100,000} = \\
B & \quad 1,000,000,000 = \\
M & \quad \frac{1}{100,000} \cdot \frac{1}{1000} = \\
Y & \quad 10^8 \div \frac{1}{10,000} = \\
V & \quad 10^6 \cdot 10^{-8} = \\
T & \quad \frac{10^3}{10^{-4}} = \\
G & \quad 10^{-10} \cdot \frac{1}{1000} = \\
R & \quad 1000 \div \frac{1}{10} = \\
N & \quad \frac{1}{10^4} = \\
\end{align*}
\]
HIDDEN MESSAGE

Write each expanded form below as a decimal numeral and find these decimal numerals in the rectangle. Look for the decimal numerals from left to right across the rectangle. Shade in the boxes containing each answer. When you finish, there will be 31 boxes not shaded in.

STARTING ON THE TOP LINE AND WORKING FROM LEFT TO RIGHT, PRINT THE 31 REMAINING LETTERS IN THE BOXES AT THE BOTTOM OF THE PAGE. A HIDDEN MESSAGE WILL APPEAR!

1. \((7 \times 10^4) + (6 \times 10^3) + (9 \times 10^0) =\)
2. \((5 \times 10^6) + (4 \times 10^2) + (8 \times 10) =\)
3. \((4 \times 10^1) + (6 \times 10^0) + (3 \times 10^{-1}) =\)
4. \((2 \times 10^3) + (5 \times 10) + (7 \times 10^{-2}) + (1 \times 10^{-3}) =\)
5. \((4 \times 10^4) + (8 \times 10^{-1}) + (2 \times 10^{-3}) + (2 \times 10^{-4}) =\)
6. \((5 \times 10^0) + (4 \times 10^{-4}) =\)
7. \((7 \times 10^2) + (6 \times 10^{-2}) + (9 \times 10^{-5}) =\)
8. \((2 \times 10) + (5 \times 10^{-1}) + (7 \times 10^{-3}) + (1 \times 10^{-4}) =\)
9. \((4 \times 10^3) + (6 \times 10^0) + (3 \times 10^{-5}) + (6 \times 10^{-6}) =\)
10. \((4 \times 10^0) + (8 \times 10^{-2}) + (2 \times 10^{-4}) =\)
**Did You Hear About. . .**

DIRECTIONS: Write any fraction or mixed numeral below as a decimal numeral. Find this decimal in one of the answer columns and notice the word next to it. Write this word in the box that has the same letter as the exercise. **KEEP WORKING AND YOU WILL HEAR ABOUT A REAL FRAME-UP!**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000973—AND</td>
<td>-0.087—CHAIR</td>
<td>61.8—PLUMBER</td>
<td>61.08—EYE</td>
<td>14.0605—GRINDING</td>
<td>-0.00065—A</td>
</tr>
<tr>
<td>-0.00065—SIX</td>
<td>0.043201—OF</td>
<td>-500.06—SO</td>
<td>0.9—THE</td>
<td>-0.4954—HIS</td>
<td>0.43201—OUT</td>
</tr>
<tr>
<td>-500.6—INTO</td>
<td>1.000973—FOR</td>
<td>-0.775—DOCTOR</td>
<td>14.00605—CASE</td>
<td>-0.000065—A</td>
<td>-0.00004—MACHINE</td>
</tr>
</tbody>
</table>

**A**  $\frac{9}{10} = \frac{0.9}{1} = 0.9$

**B** $\frac{7}{10} = 0.7$

**C** $\frac{37}{100} = 0.37$

**D** $\frac{61}{100} = 0.61$

**E** $\frac{775}{1000} = 0.775$

**F** $\frac{84}{1000} = 0.084$

**G** $\frac{5}{1000} = 0.005$

**H** $\frac{500}{10} = 50.0$

**I** $\frac{4954}{10000} = 0.4954$

**J** $\frac{87}{10000} = 0.0087$

**K** $\frac{605}{10000} = 0.0605$

**L** $\frac{4}{100000} = 0.00004$

**M** $\frac{973}{1000000} = 0.000973$

**N** $\frac{2001}{100000} = 0.02001$

**O** $\frac{65}{10000000} = 0.000065$

**P** $\frac{5}{10000} = 0.00005$

**Q** $\frac{43201}{1000000} = 0.043201$

**R** $\frac{9}{1000} = 0.009$
# Why Are Elephants Poor Dancers?

Round each number below as indicated. Circle the letter of each correct answer. Then rearrange the circled letters in each grid to make a word. Write the words in order in the boxes at the bottom of the page.

WHEN YOU FINISH, YOU WILL KNOW WHY ELEPHANTS ARE SUCH POOR DANCERS!

<table>
<thead>
<tr>
<th>Number</th>
<th>Round to</th>
<th>Letter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.37</td>
<td>to the nearest tenth</td>
<td>L</td>
<td>0.3</td>
</tr>
<tr>
<td>-2.474</td>
<td>to the nearest hundredth</td>
<td>O</td>
<td>5.9001</td>
</tr>
<tr>
<td>76.0835</td>
<td>to the nearest thousandth</td>
<td>H</td>
<td>-2.47</td>
</tr>
<tr>
<td>5.90019</td>
<td>to the nearest ten thousandth</td>
<td>Y</td>
<td>5.9002</td>
</tr>
<tr>
<td>-4.0822</td>
<td>to the nearest tenth</td>
<td>P</td>
<td>98.501</td>
</tr>
<tr>
<td>98.500296</td>
<td>to the nearest thousandth</td>
<td>I</td>
<td>7.79</td>
</tr>
<tr>
<td>-0.7608</td>
<td>to the nearest hundredth</td>
<td>D</td>
<td>-4.08</td>
</tr>
<tr>
<td>7.796</td>
<td>to the nearest hundredth</td>
<td>V</td>
<td>-0.76</td>
</tr>
<tr>
<td>55.95</td>
<td>to the nearest tenth</td>
<td>N</td>
<td>0.7477</td>
</tr>
<tr>
<td>-0.0499</td>
<td>to the nearest thousandth</td>
<td>O</td>
<td>56.0</td>
</tr>
<tr>
<td>0.747608</td>
<td>to the nearest ten thousandth</td>
<td>H</td>
<td>55.9</td>
</tr>
<tr>
<td>8.999</td>
<td>to the nearest hundredth</td>
<td>L</td>
<td>1.00</td>
</tr>
<tr>
<td>-39.95</td>
<td>to the nearest tenth</td>
<td>T</td>
<td>-40.0</td>
</tr>
<tr>
<td>-60.00905</td>
<td>to the nearest thousandth</td>
<td>E</td>
<td>9.00</td>
</tr>
<tr>
<td>0.9971</td>
<td>to the nearest hundredth</td>
<td>B</td>
<td>-60.01</td>
</tr>
<tr>
<td>75.180763</td>
<td>to the nearest hundredth</td>
<td>F</td>
<td>10.0</td>
</tr>
<tr>
<td>-59.9999</td>
<td>to the nearest thousandth</td>
<td>L</td>
<td>75.19</td>
</tr>
<tr>
<td>9.9955</td>
<td>to the nearest hundredth</td>
<td>G</td>
<td>-59.999</td>
</tr>
<tr>
<td>9.9955</td>
<td>to the nearest tenth</td>
<td>E</td>
<td>75.18</td>
</tr>
</tbody>
</table>

---

**Pre-Algebra with Pizzazz!**
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70
What Is The Difference Between A Buffalo And A Birthday Cake?

THE ANSWER TO THIS IMPORTANT QUESTION IS WRITTEN IN CODE AT THE BOTTOM OF THE PAGE. TO DECODE:

Find the decimal name for any fraction below. Round the decimal to the nearest THOUSANDTH (unless the decimal terminates at or before the thousandths place). Each time your answer appears in the code, write the letter of that exercise above it. Keep working and you will discover the answer to the title question.

V \frac{1}{3} = \quad D \frac{13}{15} = \quad I \frac{19}{32} =

K \frac{4}{7} = \quad F \frac{8}{9} = \quad B \frac{1}{20} =

O \frac{7}{12} = \quad S \frac{4}{11} = \quad R \frac{2}{3} =

T \frac{11}{16} = \quad A \frac{7}{100} = \quad E \frac{4}{5} =

W \frac{3}{8} = \quad Y \frac{5}{6} = \quad M \frac{6795}{10,000} =

C \frac{1}{2} = \quad U \frac{59}{99} = \quad H \frac{3}{4} =

coded answer

0.75 \quad 0.07 \quad 0.333 \quad 0.8 \quad 0.833 \quad 0.583 \quad 0.596

0.8 \quad 0.333 \quad 0.8 \quad 0.667 \quad 0.75 \quad 0.8 \quad 0.07 \quad 0.667 \quad 0.867 \quad 0.583 \quad 0.889

0.07 \quad 0.75 \quad 0.583 \quad 0.680 \quad 0.8 \quad 0.375 \quad 0.75 \quad 0.8 \quad 0.667 \quad 0.8

0.688 \quad 0.75 \quad 0.8 \quad 0.05 \quad 0.594 \quad 0.667 \quad 0.688 \quad 0.75 \quad 0.867 \quad 0.07 \quad 0.833

0.5 \quad 0.07 \quad 0.571 \quad 0.8 \quad 0.364 \quad 0.667 \quad 0.583 \quad 0.07 \quad 0.680

PRE-ALGEBRA WITH PIZAZZ!
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DIRECTIONS:
Name each fraction below as a repeating decimal and find these decimals in the maze. SHADE IN each room that contains a correct answer.

Then find a path to the Treasure that goes only through rooms you have NOT shaded in. The words in those rooms will form an a-mazing message.

1. \( \frac{1}{3} = \)
2. \( \frac{5}{9} = \)
3. \( \frac{5}{6} = \)
4. \( \frac{7}{15} = \)
5. \( \frac{5}{12} = \)
6. \( \frac{3}{7} = \)
7. \( \frac{48}{99} = \)
8. \( \frac{1}{11} = \)
9. \( \frac{2}{11} = \)
10. \( \frac{3}{11} = \)
11. \( \frac{5}{27} = \)
12. \( \frac{1}{13} = \)
13. \( \frac{3}{22} = \)
14. \( \frac{2}{3} = \)
Famous Dieters' Slogan

Name each fraction below as a mixed decimal numeral in hundredths. For example, \( \frac{1}{3} = 0.33 \frac{1}{3} \).

Find your answers in the rectangle. Cross out the boxes that contain the answers. When you finish, there will be 12 boxes not crossed out. Print the letters from these boxes in the boxes at the bottom of the page. A hidden message will appear!

\[
\begin{align*}
\text{1} & \quad \frac{2}{3} = \quad \text{6} & \quad \frac{1}{15} = \quad \text{11} & \quad \frac{7}{27} = \\
\text{2} & \quad \frac{1}{8} = \quad \text{7} & \quad \frac{4}{3} = \quad \text{12} & \quad \frac{19}{8} = \\
\text{3} & \quad \frac{7}{12} = \quad \text{8} & \quad \frac{29}{32} = \quad \text{13} & \quad \frac{3}{8} = \\
\text{4} & \quad \frac{11}{16} = \quad \text{9} & \quad \frac{17}{16} = \quad \text{14} & \quad \frac{43}{8} = \\
\text{5} & \quad \frac{8}{9} = \quad \text{10} & \quad \frac{7}{8} = \quad \text{15} & \quad \frac{20}{3} = \\
\end{align*}
\]

<table>
<thead>
<tr>
<th>EA</th>
<th>TA</th>
<th>DO</th>
<th>OR</th>
<th>KE</th>
<th>NT</th>
<th>RY</th>
<th>LE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.06\frac{1}{4}</td>
<td>7.66\frac{2}{3}</td>
<td>3.62\frac{7}{8}</td>
<td>0.12\frac{1}{2}</td>
<td>0.83\frac{1}{3}</td>
<td>6.65\frac{1}{3}</td>
<td>0.37\frac{1}{2}</td>
<td>2.37\frac{7}{8}</td>
</tr>
<tr>
<td>SS</td>
<td>TG</td>
<td>OT</td>
<td>OO</td>
<td>MU</td>
<td>CH</td>
<td>DF</td>
<td>AB</td>
</tr>
<tr>
<td>0.06\frac{2}{3}</td>
<td>0.37\frac{1}{8}</td>
<td>3.62\frac{1}{2}</td>
<td>0.87\frac{1}{8}</td>
<td>0.25\frac{25}{27}</td>
<td>0.66\frac{2}{3}</td>
<td>0.06\frac{2}{5}</td>
<td>6.66\frac{2}{3}</td>
</tr>
<tr>
<td>OO</td>
<td>ST</td>
<td>DG</td>
<td>ET</td>
<td>OP</td>
<td>OT</td>
<td>LE</td>
<td>SS</td>
</tr>
<tr>
<td>0.90\frac{3}{16}</td>
<td>5.37\frac{1}{2}</td>
<td>0.12\frac{1}{8}</td>
<td>0.90\frac{5}{8}</td>
<td>0.16\frac{2}{3}</td>
<td>0.58\frac{5}{6}</td>
<td>0.68\frac{3}{4}</td>
<td>1.33\frac{1}{3}</td>
</tr>
<tr>
<td>SL</td>
<td>OW</td>
<td>IN</td>
<td>AI</td>
<td>NT</td>
<td>UP</td>
<td>ST</td>
<td>OP</td>
</tr>
<tr>
<td>0.58\frac{1}{3}</td>
<td>0.16\frac{1}{6}</td>
<td>0.62\frac{1}{2}</td>
<td>0.25\frac{4}{27}</td>
<td>0.88\frac{8}{9}</td>
<td>0.87\frac{1}{2}</td>
<td>1.06\frac{7}{8}</td>
<td>2.37\frac{1}{2}</td>
</tr>
</tbody>
</table>

PRE-ALGEBRA WITH PIZZAZZ!
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Converting Decimals, Fractionally

1. "I TORE HIS VALENTINE IN TWO," Cleopatra said

2. "IF I ONLY HAD A BRAIN," said the Scarecrow

3. "MY HORSE WON'T STOP," Wild Bill said

4. "ACCIDENTS WILL HAPPEN," said Captain Hook

THESE FOUR STATEMENTS WERE NOT MERELY "SAID." EACH WAS SAID IN A CERTAIN WAY. TO FIND OUT HOW EACH STATEMENT WAS SAID, FOLLOW THESE DIRECTIONS:

Name any repeating decimal numeral below as a fraction in lowest terms. Then find this fraction in the code. Each time it appears in the code, write the letter of that exercise above it. Keep working and you will discover how each statement was said.

T 0.\overline{6} =  L 1.\overline{2} =  I 0.\overline{153} =  A 1.27 =
W 0.4 =  R 0.\overline{90} =  M 0.1\overline{6} =  N 0.0\overline{36} =
Y 1.\overline{3} =  E 1.3\overline{7} =  U 0.1\overline{3} =  D 0.2\overline{4} =
B 0.6\overline{9} =  S 0.01\overline{8} =  O 0.3\overline{8} =  H 0.2\overline{40} =
F 0.2\overline{4} =
WHY COULDN'T ORGO KEEP HIS WATERBED A SECRET?

TO ANSWER THIS IMPORTANT QUESTION:
Express any number in the left column in SCIENTIFIC NOTATION. Find your answer in the right column and draw a straight line connecting the two numbers. Each line will cross a number and a letter. The number tells you where to put the letter in the row of boxes at the bottom of the page.

7000
7,000,000
70
700,000
70,000,000,000
700
70,000,000
70,000
0.07
0.000007
0.007
0.00000007
0.7
0.00007
0.0000007
0.0007
0.00000000007
0.0000000007

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

7 \times 10^7
7 \times 10^{-5}
7 \times 10^{-4}
7 \times 10^2
7 \times 10^3
7 \times 10^{-2}
7 \times 10^{-3}
7 \times 10^5
7 \times 10^{-10}
7 \times 10^{10}
7 \times 10^{-6}
7 \times 10^6
7 \times 10^{-12}
7 \times 10^{-8}
7 \times 10^1
7 \times 10^{-1}
7 \times 10^{-7}
7 \times 10^4
## What Has Long Hair And Purple Feet?

Express the number in each statement below in scientific notation. Select your answer from the two choices given. Write the letter of the correct choice in each box at the bottom of the page that contains the statement number.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Choices</th>
<th>Correct Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>The mean distance from the surface of the earth to the surface of the moon is 376,000 kilometers.</td>
<td>(E) $3.76 \times 10^5$ (R) $3.76 \times 10^4$</td>
<td>(E)</td>
</tr>
<tr>
<td>The tallest structure in the world is the Warszawa Radio Mast in Plock, Poland, completed in May 1974. It measures 650 meters in height.</td>
<td>(S) $6.5 \times 10^2$ (A) $65 \times 10^2$</td>
<td>(A)</td>
</tr>
<tr>
<td>The heaviest bell in the world is the Tsar Kolokol, cast in 1733 in Moscow, U.S.S.R. It weighs 196,000 kilograms.</td>
<td>(I) $1.96 \times 10^3$ (H) $1.96 \times 10^5$</td>
<td>(H)</td>
</tr>
<tr>
<td>One light-year, the distance traveled by light in one year, is 9,460,000,000,000 kilometers.</td>
<td>(T) $9.46 \times 10^{10}$ (O) $9.46 \times 10^{12}$</td>
<td>(O)</td>
</tr>
<tr>
<td>Sirius A (the Dog Star) is the brightest star visible in the heavens. It has a mass of 46,500,000,000,000,000,000,000,000,000 kilograms.</td>
<td>(D) $4.65 \times 10^{30}$ (K) $4.65 \times 10^{31}$</td>
<td>(D)</td>
</tr>
<tr>
<td>The nearest star beyond our sun is the very faint Proxima Centauri, which is 40,300,000,000,000 kilometers from the earth.</td>
<td>(T) $4.03 \times 10^{13}$ (S) $4.03 \times 10^{11}$</td>
<td>(S)</td>
</tr>
<tr>
<td>The smallest known insects are the &quot;hairy-winged&quot; beetles of the Trichopterygidae family. They measure only 0.02 centimeters in length.</td>
<td>(B) $2 \times 10^{-3}$ (M) $2 \times 10^{-2}$</td>
<td>(M)</td>
</tr>
<tr>
<td>The wavelength of yellow light is 0.000058 centimeters.</td>
<td>(A) $5.8 \times 10^{-5}$ (U) $5.8 \times 10^{-4}$</td>
<td>(U)</td>
</tr>
<tr>
<td>The wavelength of one type of X-ray is 0.0000000128 centimeters.</td>
<td>(N) $1.28 \times 10^{-8}$ (L) $1.28 \times 10^{-10}$</td>
<td>(L)</td>
</tr>
<tr>
<td>The smallest identified virus is the potato spindle tuber virus, which has a diameter of less than 0.000002 centimeters.</td>
<td>(I) $2 \times 10^{-6}$ (U) $2 \times 10^{-5}$</td>
<td>(U)</td>
</tr>
<tr>
<td>One of the least stable atomic particles is the rho prime meson, which has a lifetime of 0.0000000000000000000000000000016 seconds.</td>
<td>(L) $1.6 \times 10^{-24}$ (P) $1.6 \times 10^{-23}$</td>
<td>(L)</td>
</tr>
<tr>
<td>The mass of an electron is 0.0000000000000000000000000000009 grams.</td>
<td>(F) $9 \times 10^{-26}$ (W) $9 \times 10^{-28}$</td>
<td>(F)</td>
</tr>
</tbody>
</table>

**PRE-ALGEBRA WITH PIZZAZZ!**
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# FIND A MATCH

Each of the two blocks below is divided into 25 boxes. Boxes in the top block contain numbers in scientific notation. Express any of these numbers as a decimal numeral and find this decimal in the bottom block. Write the word from the top box in the bottom box. Work doggedly and you will spell out a hot message.

<table>
<thead>
<tr>
<th>$8 \times 10^2$</th>
<th>$8 \times 10^{-4}$</th>
<th>$8 \times 10^{-9}$</th>
<th>$8 \times 10^6$</th>
<th>$8 \times 10^{-12}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>THAT</td>
<td>OF</td>
<td>BOTH</td>
<td>ARE</td>
<td>THE</td>
</tr>
<tr>
<td>$8 \times 10^{-11}$</td>
<td>$8 \times 10^{10}$</td>
<td>$8 \times 10^9$</td>
<td>$4.5 \times 10^{-2}$</td>
<td>$4.5 \times 10^4$</td>
</tr>
<tr>
<td>MANY</td>
<td>TO</td>
<td>THESE</td>
<td>VERY</td>
<td>IS</td>
</tr>
<tr>
<td>$4.5 \times 10^{-8}$</td>
<td>$4.5 \times 10^{11}$</td>
<td>$4.5 \times 10^{-3}$</td>
<td>$4.5 \times 10^{-6}$</td>
<td>$4.5 \times 10^7$</td>
</tr>
<tr>
<td>GETTING</td>
<td>IT</td>
<td>SO</td>
<td>DAYS</td>
<td>DOG</td>
</tr>
<tr>
<td>$4.5 \times 10^5$</td>
<td>$1.23 \times 10^3$</td>
<td>$1.23 \times 10^{-1}$</td>
<td>$1.23 \times 10^7$</td>
<td>$1.23 \times 10^{-10}$</td>
</tr>
<tr>
<td>HARD</td>
<td>HOT</td>
<td>BEEF</td>
<td>MAKERS</td>
<td>FINDING</td>
</tr>
<tr>
<td>$1.23 \times 10^8$</td>
<td>$1.23 \times 10^{-5}$</td>
<td>$1.23 \times 10^9$</td>
<td>$1.23 \times 10^{-7}$</td>
<td>$1.23 \times 10^{-6}$</td>
</tr>
<tr>
<td>ENDS</td>
<td>PRICE</td>
<td>HIGH</td>
<td>MEAT</td>
<td>MAKE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$0.000000000008$</th>
<th>$0.0000123$</th>
<th>$0.0008$</th>
<th>$0.123$</th>
<th>$45,000$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.0000000045$</td>
<td>$0.0045$</td>
<td>$1,230,000,000$</td>
<td>$8,000,000,000$</td>
<td>$0.00000045$</td>
</tr>
<tr>
<td>$800$</td>
<td>$0.00000000008$</td>
<td>$1230$</td>
<td>$45,000,000$</td>
<td>$12,300,000$</td>
</tr>
<tr>
<td>$8,000,000$</td>
<td>$0.000000000123$</td>
<td>$450,000,000,000$</td>
<td>$0.045$</td>
<td>$450,000$</td>
</tr>
<tr>
<td>$80,000,000,000$</td>
<td>$0.00000123$</td>
<td>$0.000000008$</td>
<td>$123,000,000$</td>
<td>$0.000000123$</td>
</tr>
</tbody>
</table>
What did Dr. Watson say about SHERLOCK?

Work any problem below and find your answer in the answer columns. Write the letter of the answer in each box at the bottom of the page that contains the problem number.

KEEPT WORKING AND YOU WILL DISCOVER THE ANSWER TO THE TITLE QUESTION.

1. \((4 \times 10^5)(2 \times 10^3)\)
2. \((3 \times 10^{-4})(3 \times 10^7)\)
3. \((9 \times 10^3)(7 \times 10^{-1})\)
4. \((6 \times 10^{-5})(7 \times 10^{-2})\)
5. \((8 \times 10^{-13})(5 \times 10^4)\)
6. \((3.6 \times 10^6)(2 \times 10^3)\)
7. \((5 \times 10^{-12})(8.1 \times 10^{15})\)
8. \((7.6 \times 10^{-4})(6 \times 10^{-4})\)
9. \((3.5 \times 10^1)(4.5 \times 10^{-10})\)
10. \((6.8 \times 10^{-18})(2.5 \times 10^{-12})\)
11. Light travels at a speed of \(3 \times 10^5\) kilometers per second. Light from Sirius A, the brightest star in the heavens, takes \(2.7 \times 10^6\) seconds to reach the earth. What is the distance to Sirius A?

12. In his book, *Six-Legged Science*, Brian Hocking estimates that the insect population of the world is at least \(1 \times 10^{18}\) if the average weight of each insect is \(2.5 \times 10^{-3}\) grams, what is the total weight of the insect population?

13. The human population of the world is estimated at \(4.5 \times 10^9\). If the average weight of each human is \(5.5 \times 10^4\) grams, what is the total weight of the human population?
Did You Hear About...?

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>I</td>
<td>J</td>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
</tr>
</tbody>
</table>

**DIRECTIONS:** Work any problem below. Find your answer in one of the answer columns and notice the word next to it. Write this word in the box with the same letter as the problem. KEEP WORKING AND YOU WILL HEAR ABOUT SOMETHING NOTEWORTHY!

<table>
<thead>
<tr>
<th>Problem</th>
<th>Equation</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$2 \times 10^{10}$—AWAY</td>
<td>$9 \times 10^6$ $3 \times 10^2$</td>
</tr>
<tr>
<td>B</td>
<td>$2 \times 10^{12}$—FIVE</td>
<td>$8 \times 10^3$ $2 \times 10^9$</td>
</tr>
<tr>
<td>C</td>
<td>$2.6 \times 10^4$—TEN</td>
<td>$6 \times 10^{-1}$ $3 \times 10^4$</td>
</tr>
<tr>
<td>D</td>
<td>$8 \times 10^{-2}$—MUSIC</td>
<td>$4.8 \times 10^{-7}$ $4 \times 10^{-5}$</td>
</tr>
<tr>
<td>E</td>
<td>$1.5 \times 10^{12}$—WERE</td>
<td>$7.5 \times 10^8$ $5 \times 10^{-2}$</td>
</tr>
<tr>
<td>F</td>
<td>$1.2 \times 10^{-2}$—WHO</td>
<td>$3.5 \times 10$ $7 \times 10^{-9}$</td>
</tr>
<tr>
<td>G</td>
<td>$2 \times 10^{-4}$—TIGERS</td>
<td>$6.4 \times 10^3$ $8 \times 10^4$</td>
</tr>
<tr>
<td>H</td>
<td>$3 \times 10^5$—A</td>
<td>$4.5 \times 10^{-6}$ $1.5 \times 10^2$</td>
</tr>
<tr>
<td>I</td>
<td>$4 \times 10^{-6}$—TWO</td>
<td>$7.2 \times 10^{-10}$ $1.8 \times 10^{-3}$</td>
</tr>
<tr>
<td>J</td>
<td>$5 \times 10^{-1}$—CASH</td>
<td>$4 \times 10^5$ $8 \times 10^2$</td>
</tr>
<tr>
<td>K</td>
<td>$5 \times 10^2$—GOT</td>
<td>$3 \times 10^3$ $1.5 \times 10^{-7}$</td>
</tr>
<tr>
<td>L</td>
<td>$2.6 \times 10^3$—THE</td>
<td>$8 \times 10^{-1}$ $1.6 \times 10^{-8}$</td>
</tr>
<tr>
<td>M</td>
<td>$3 \times 10^{-8}$—STORE</td>
<td>$6 \times 10^2$—DOUGH</td>
</tr>
<tr>
<td>N</td>
<td>$4 \times 10^{-5}$—FOR</td>
<td>$2 \times 10^5$—LUTE</td>
</tr>
</tbody>
</table>

**M:** Jupiter, the largest planet in our solar system, is $7.8 \times 10^8$ kilometers from the sun. The speed of light is $3 \times 10^5$ kilometers per second. How many seconds does it take sunlight to reach Jupiter?

**N:** The total length of all the drawers in a library card catalog is $5 \times 10^3$ centimeters. If each card has a thickness of $2.5 \times 10^{-2}$ centimeters, how many cards will fit in the card catalog?
An Important Fact about YOU!

AN IMPORTANT FACT ABOUT YOU IS HIDDEN IN THE MESSAGE BELOW.

TO FIND IT:

Round both numbers in any exercise to one significant digit. Then express the numbers in scientific notation and do the exercise. This gives you an ESTIMATE of the answer to the original exercise.

Find each estimate in the rectangle and shade out the letter above it. When you finish, the important fact about you will remain.
**GET THE MESSAGE**

**DIRECTIONS:**
Decide whether each of these decimals represents a rational number or an irrational number. Circle the letter in the appropriate column next to each decimal.

When you finish, print the circled letters in the row of boxes at the bottom of the page. FIRST print those from the column marked "Rational," THEN print those from the column marked "Irrational."

*A MESSAGE WILL APPEAR!

<table>
<thead>
<tr>
<th>RATIONAL</th>
<th>IRRATIONAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.135135135135...</td>
<td>M</td>
</tr>
<tr>
<td>0.6</td>
<td>A</td>
</tr>
<tr>
<td>~2.2422422422422422224...</td>
<td>N</td>
</tr>
<tr>
<td>~0.29292929292929292...</td>
<td>I</td>
</tr>
<tr>
<td>~0.06006000600006...</td>
<td>L</td>
</tr>
<tr>
<td>0.7105386266520861...</td>
<td>N</td>
</tr>
<tr>
<td>3.40764076407640764076...</td>
<td>D</td>
</tr>
<tr>
<td>~15.233333333...</td>
<td>M</td>
</tr>
<tr>
<td>0.61661166611166611116...</td>
<td>E</td>
</tr>
<tr>
<td>~0.142857142857142857...</td>
<td>A</td>
</tr>
<tr>
<td>~74.7584630674348297...</td>
<td>K</td>
</tr>
<tr>
<td>6.125</td>
<td>R</td>
</tr>
<tr>
<td>0.7866666666...</td>
<td>I</td>
</tr>
<tr>
<td>~73.0002525252525...</td>
<td>O</td>
</tr>
<tr>
<td>40.864301019654885385...</td>
<td>R</td>
</tr>
<tr>
<td>~9.70712122122122212...</td>
<td>N</td>
</tr>
<tr>
<td>200.0096009600960096...</td>
<td>N</td>
</tr>
<tr>
<td>0.112123123412345...</td>
<td>W</td>
</tr>
<tr>
<td>17.70027485281086486350...</td>
<td>H</td>
</tr>
<tr>
<td>~8.0</td>
<td>M</td>
</tr>
<tr>
<td>~0.99999199991199991119...</td>
<td>A</td>
</tr>
<tr>
<td>3.14159265358979323846...</td>
<td>K</td>
</tr>
</tbody>
</table>

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What Was the Crow Doing on the Telephone Wire?

Circle the letter of the phrase which best completes each statement below. Write this letter in each box at the bottom of the page that contains the statement number.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Option A</th>
<th>Option B</th>
<th>Option C</th>
<th>Option D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. A decimal in which the same sequence of digits repeats again and again is called a(n)</td>
<td>(O) repeating decimal</td>
<td>(P) irrational number</td>
<td>(Q) rational number</td>
<td>(R) nonrepeating decimal</td>
</tr>
<tr>
<td>2. Every repeating decimal represents a (n)</td>
<td>(F) irrational number</td>
<td>(G) rational number</td>
<td>(H) repeating decimal</td>
<td>(I) nonrepeating decimal</td>
</tr>
<tr>
<td>3. An irrational number is a number that is represented by a</td>
<td>(J) repeating decimal</td>
<td>(K) rational number</td>
<td>(L) nonrepeating decimal</td>
<td>(M) terminating decimal</td>
</tr>
<tr>
<td>4. Every rational number can be represented either by a repeating decimal or by a</td>
<td>(N) irrational number</td>
<td>(O) rational number</td>
<td>(P) nonrepeating decimal</td>
<td>(Q) terminating decimal</td>
</tr>
<tr>
<td>5. A number that can be represented by a fraction is a(n)</td>
<td>(T) irrational number</td>
<td>(U) rational number</td>
<td>(V) nonrepeating decimal</td>
<td>(W) terminating decimal</td>
</tr>
<tr>
<td>6. An integer is a(n)</td>
<td>(D) irrational number</td>
<td>(E) rational number</td>
<td>(F) nonrepeating decimal</td>
<td>(G) terminating decimal</td>
</tr>
<tr>
<td>7. Between any two rational numbers there is a(n)</td>
<td>(I) irrational number</td>
<td>(J) rational number</td>
<td>(K) nonrepeating decimal</td>
<td>(L) terminating decimal</td>
</tr>
<tr>
<td>8. The union of the set of rational numbers and the set of irrational numbers is called the</td>
<td>(M) irrational number</td>
<td>(N) rational number</td>
<td>(O) nonrepeating decimal</td>
<td>(P) terminating decimal</td>
</tr>
<tr>
<td>9. Every repeating or nonrepeating decimal represents a</td>
<td>(L) real number</td>
<td>(M) rational number</td>
<td>(N) irrational number</td>
<td>(O) terminating decimal</td>
</tr>
<tr>
<td>10. A real number that is not a rational number is a(n)</td>
<td>(P) repeating decimal</td>
<td>(Q) irrational number</td>
<td>(R) nonrepeating decimal</td>
<td>(S) terminating decimal</td>
</tr>
<tr>
<td>11. A real number that can be represented by a nonrepeating decimal is a(n)</td>
<td>(R) rational number</td>
<td>(S) irrational number</td>
<td>(T) nonrepeating decimal</td>
<td>(U) terminating decimal</td>
</tr>
<tr>
<td>12. Every point on the number line can be named by a(n)</td>
<td>(F) irrational number</td>
<td>(G) rational number</td>
<td>(H) real number</td>
<td>(I) nonreal number</td>
</tr>
<tr>
<td>13. Between any two points on the number line, there is a(n)</td>
<td>(H) empty set</td>
<td>(I) point</td>
<td>(J) two points</td>
<td>(K) one point</td>
</tr>
<tr>
<td>14. Every repeating or nonrepeating decimal numeral determines</td>
<td>(A) one point on the number line</td>
<td>(B) two points on the number line</td>
<td>(C) point</td>
<td>(D) empty set</td>
</tr>
</tbody>
</table>
Ratio Activity

Express any ratio below as a fraction in lowest terms. Find this ratio in the answer columns and notice the number to the left of it. Each time this number appears in the code, write the letter of the problem above it. Keep working and you will decode the message.

S 4 : 12
N 48 : 6
O \frac{1}{5} \text{ to } \frac{1}{2}
R \frac{3}{4} : \frac{2}{3}
U 40 \text{ seconds to 3 minutes}

Y \frac{15}{25}
K \frac{48}{32}
G \frac{5}{8}
L \frac{3}{3}
W 1\frac{1}{2} \text{ to 7}

F 21 to 49
E 96 to 24
T \frac{3}{8} : 2\frac{1}{4}

WORLD RECORD: Wilt Chamberlain scored 100 points in a single basketball game on March 2, 1962. In that game, he made 36 field goals (baskets) in 63 attempts. Find the ratio of field goals to attempts.

Sonny Jurgensen set a record for the most passes completed in a football season. He completed 288 passes in 508 attempts. Find the ratio of completed passes to attempts.

The 1906 Chicago baseball team set a record by losing only 36 games out of 154 games that they played. Find the ratio of games won to games played.

The Boston Bruins hockey team set a record by winning 57 games against 7 ties and 14 losses. Find the ratio of games won to games played.
Crack The Code

Solve any proportion below and find your answer in the code at the bottom of the page. Each time the answer appears in the code, write the letter in that proportion above the answer. Keep working and you will decode the poem.

1. \[ \frac{10}{6} = \frac{15}{F} \quad F = \]
2. \[ \frac{6}{4} = \frac{H}{10} \quad H = \]
3. \[ \frac{4}{A} = \frac{9}{18} \quad A = \]
4. \[ \frac{C}{15} = \frac{21}{9} \quad C = \]
5. \[ \frac{24}{D} = \frac{16}{22} \quad D = \]
6. \[ \frac{15}{20} = \frac{18}{K} \quad K = \]
7. \[ \frac{N}{49} = \frac{10}{35} \quad N = \]
8. \[ \frac{2}{1} = \frac{U}{25} \quad U = \]
9. \[ \frac{16}{40} = \frac{24}{Y} \quad Y = \]
10. \[ \frac{L}{15} = \frac{14}{10} \quad L = \]
11. \[ \frac{2 \frac{1}{2}}{5} = \frac{P}{4} \quad P = \]
12. \[ \frac{12}{I} = \frac{14}{3 \frac{1}{2}} \quad I = \]
13. \[ \frac{5}{10} = \frac{V}{3} \quad V = \]
14. \[ \frac{E}{5} = \frac{2}{3} \quad E = \]
15. \[ \frac{4}{1} = \frac{11}{B} \quad B = \]
16. \[ \frac{9}{S} = \frac{5}{2} \quad S = \]
17. \[ \frac{M}{4} = \frac{\frac{1}{2}}{5} \quad M = \]
18. \[ \frac{3}{2} = \frac{2}{O} \quad O = \]
19. \[ \frac{3}{11} = \frac{T}{3} \quad T = \]
20. \[ \frac{7}{R} = \frac{16}{2} \quad R = \]

\[
\begin{align*}
\frac{7}{8} & \cdot 50 & \cdot \frac{9}{11} & \cdot 15 \\
\frac{7}{8} & \cdot 2 \frac{1}{3} & \cdot 33 & \cdot 3 \frac{1}{3} \\
2 \frac{1}{3} & \cdot 14 & & \\
1 \frac{1}{5} & \cdot 60 & & \\
1 \frac{1}{5} & \cdot 2 \frac{1}{3} & \cdot \frac{9}{11} & \cdot 2 \frac{1}{3} \cdot \frac{7}{8} \\
& & & \frac{2}{3} \cdot 3 \cdot 24 \cdot 3 \frac{1}{3} \\
2 \frac{1}{3} \cdot 14 & \cdot \frac{9}{11} & \cdot 3 \frac{1}{3} & \cdot 3 \frac{1}{3} \cdot 8 & \cdot \frac{9}{11} & \\
& & & 3 \cdot 14 & \cdot \frac{2}{3} \cdot 8 \cdot 35 \cdot 24 & \\
& & & 2 \frac{1}{3} \cdot 9 & & \frac{1}{5} \cdot 3 \frac{1}{3} \\
3 & \cdot \frac{9}{11} & \cdot 2 \frac{1}{3} & \cdot 2 \frac{1}{3} & \cdot 24 & \\
& & & \frac{2}{3} \cdot 4 \cdot 50 & \cdot 1 \frac{1}{5} & \cdot 2 \\
& & & 8 & \cdot \frac{9}{11} & 9 \cdot 3 \cdot 9 & \cdot \frac{9}{11} \cdot 60 \\
& & & 9 \cdot 3 \cdot 1 \frac{1}{2} & \cdot 3 \frac{1}{3} & \\
8 \cdot 14 \cdot 33 & & & & & \\
& & & & & \frac{7}{8} \cdot 2 \frac{1}{3} & \cdot 33 & \cdot 3 \frac{1}{3} \\
& & & & & 2 \frac{1}{3} \cdot 14 & & \frac{7}{8} \cdot 50 & \cdot \frac{9}{11} & \cdot 15 \cdot 21 & \cdot 3 \frac{1}{3} & \cdot \frac{3}{5} & \cdot \frac{3}{3} & \cdot 21 \cdot 60
\end{align*}
\]
What Do Hitchhikers Do When School Lets Out?

This puzzle illustrates two practical uses of ratio and proportion: (1) figuring the size of a reduced or enlarged photograph; and (2) figuring distance on a map.

Use the information given on any line of the two charts to figure out the missing dimension, which is indicated by a box containing a letter. Find your answer at the bottom of the page and print the letter above it. Keep working and you will discover the answer to the title question.

<table>
<thead>
<tr>
<th>ORIGINAL PHOTO</th>
<th>NEW PHOTO</th>
<th>MAP SCALE</th>
<th>TRIP TO BE TAKEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>$7 \times 12 \text{ cm}$</td>
<td>$14 \times \boxed{A} \text{ cm}$</td>
<td>$1 \text{ cm} = 50 \text{ km}$</td>
<td>$7 \text{ cm} = \boxed{N} \text{ km}$</td>
</tr>
<tr>
<td>$8 \times 10 \text{ cm}$</td>
<td>$\boxed{R} \times 15 \text{ cm}$</td>
<td>$2 \text{ cm} = 25 \text{ km}$</td>
<td>$oxed{A} \text{ cm} = 75 \text{ cm}$</td>
</tr>
<tr>
<td>$21 \times 30 \text{ cm}$</td>
<td>$7 \times \boxed{B} \text{ cm}$</td>
<td>$3 \text{ in.} = 4 \text{ mi}$</td>
<td>$10 \text{ in} = \boxed{K} \text{ mi}$</td>
</tr>
<tr>
<td>$3\frac{1}{2} \times 5 \text{ cm}$</td>
<td>$\boxed{O} \times 10 \text{ cm}$</td>
<td>$3\frac{1}{2} \text{ in.} = 5 \text{ mi}$</td>
<td>$oxed{H} \text{ in} = 16 \text{ mi}$</td>
</tr>
<tr>
<td>$8 \times 10 \text{ in.}$</td>
<td>$11 \times \boxed{E} \text{ in.}$</td>
<td>$\frac{1}{2} \text{ cm} = 100 \text{ km}$</td>
<td>$4 \text{ cm} = \boxed{T} \text{ km}$</td>
</tr>
<tr>
<td>$10 \times 16 \text{ in.}$</td>
<td>$\boxed{I} \times 4 \text{ in.}$</td>
<td>$4 \text{ in.} = 75 \text{ mi}$</td>
<td>$\boxed{T} \text{ in} = 350 \text{ mi}$</td>
</tr>
<tr>
<td>$7 \times 10 \text{ in.}$</td>
<td>$5 \times \boxed{A} \text{ in.}$</td>
<td>$1\frac{1}{2} \text{ in.} = 10 \text{ mi}$</td>
<td>$4\frac{1}{2} \text{ in} = \boxed{C} \text{ mi}$</td>
</tr>
<tr>
<td>$11 \times 20 \text{ in.}$</td>
<td>$\boxed{E} \times 8 \text{ in.}$</td>
<td>$2\frac{1}{2} \text{ in.} = 150 \text{ mi}$</td>
<td>$oxed{V} \text{ in} = 100$</td>
</tr>
<tr>
<td>$6 \times 9\frac{1}{2} \text{ in.}$</td>
<td>$4 \times \boxed{U} \text{ in.}$</td>
<td>$1 \text{ in.} = 3 \text{ mi}$</td>
<td>$\frac{1}{2} \text{ in.} = \boxed{M} \text{ mi}$</td>
</tr>
<tr>
<td>$4 \times 7 \text{ in.}$</td>
<td>$\boxed{A} \times 8\frac{1}{4} \text{ in.}$</td>
<td>$1 \text{ in.} = 500 \text{ mi}$</td>
<td>$\boxed{T} \text{ in} = 800 \text{ mi}$</td>
</tr>
</tbody>
</table>
What Should You Say
When You Meet An Angel?

Work each problem and find your answers at the bottom of the page. Shade in the letter above each correct answer. When you finish, you will know what to say!

1. If 2 cubic feet of sand weigh 90 pounds, how much do 5 cubic feet of sand weigh? **ANSWER:** ___ pounds
2. If there are 560 calories in 8 ounces of meat, how many calories are in 3 ounces of meat? ___ calories
3. If pencils sell at 6 for $0.95, how many pencils can be bought for $2.95? ___ pencils
4. A car travels 350 miles on 20 gallons of gasoline. How many gallons will be used to travel 875 miles under the same conditions? ___ gallons
5. The ratio of oil to vinegar in a certain salad dressing is 8 : 5. How much oil must be blended with 7 liters of vinegar for that recipe? ___ liters
6. The ratio of the weight of an object on Jupiter to its weight on Earth is 8 to 3. How much would a 100 pound person weigh on Jupiter? ___ pounds
7. If 1 gallon of paint covers 450 square feet, how many gallons are needed to paint a room with 675 square feet of wall surface? ___ gallons
8. If it takes 4 ounces of insecticide to make 2 1/2 gallons of garden spray, how much spray can be made with 6 ounces of insecticide? ___ gallons
9. A flagpole casts a shadow 32 feet long. If a man 6 feet tall casts a shadow 8 feet long at the same time and location, how tall is the flagpole? ___ feet
10. 4 1/3 cans of water must be added to a can of lemonade concentrate to make 64 ounces of lemonade. How many cans of water are needed to make 96 ounces of lemonade? ___ cans
11. Bronze is an alloy of copper and tin. If a certain type of bronze requires 0.3 kilogram of tin per 1.0 kilogram of copper, how much tin must be combined with 50 kilograms of copper? ___ kilograms
12. At a certain college, the ratio of men to women is 5 to 4. If there are 2800 men, how many women are there? ___ women
13. A cookie recipe which calls for 3 1/2 cups of flour makes 5 dozen cookies. How much flour is needed to make 3 dozen cookies? ___ cups
14. 3.6 grams of salt will dissolve in 10 grams of water. How many grams of salt will dissolve in 1000 grams of water? ___ grams

---

PRE-ALGEBRA WITH PIZZAZZ!
© Creative Publications
KNOCK KNOCK Who's There? Sensuous. Sensuous Who?

Sensuous

500% 11% 200% 35% 0.11% 150% 0.11% 83% 5% 0.11% 500% 5% 74% 200%

65% 0.11% 5% 35% 500% 5% 11% 4% 300% 83% 5% 375% \( \frac{2}{3} \) % 11% 50% 74% 1% 1% \( \frac{2}{3} \) % \( \frac{1}{2} \) % 300%

50% \( \frac{2}{3} \) 40% 19% 74% 83% 97.5% 50% 74% 5% 35% 1.1% 300% 40% 200% 300% 83% 5% 500%.

TO DECODE THE LAST LINE OF THIS "KNOCK-KNOCK" JOKE, FOLLOW THESE DIRECTIONS:

Write any expression below as a percent. Each time this percent appears in the code, write the letter of that expression above it.

KEEP WORKING AND YOU WILL DISCOVER THE LAST LINE OF THE "KNOCK-KNOCK" JOKE.

- H 35 hundredths
- R 40 hundredths
- N \( \frac{83}{100} \)
- I 0.74
- D 4 hundredths
- G 97.5 out of 100
- L one out of a hundred
- V \( \frac{1}{2} \) of one hundredth
- O \( \frac{2}{3} \) of one hundredth
- K the ratio of 19 to 100
- M 65 : 100
- F the ratio of 150 to 100
- Y 375 hundredths
- C \( \frac{200}{100} \)
- E 3.00
- P 1.1 out of 100
- A 0.11 of one hundredth
- U 0.11
- W \( \frac{50}{100} \)
- T \( \frac{50}{1000} \)
- S \( \frac{50}{10} \)
TEST OF KNOWLEDGE

1. WHAT LIES AT THE BOTTOM OF THE OCEAN AND SHIVERS?

   ANSWER: __________

   3 1 1 2 5 1 3 9 5 2 1 1 1
   20 200 50 3 2 2 25 4 3 50 5 100

2. WHAT DO YOU CALL AN OVERWEIGHT LION?

   ANSWER: __________

   2 67 1 1 3 1 1 1 9 1
   5 100 50 100 200 4 300 50 25 50

3. WHAT IS THE BEST WAY TO TALK TO A MONSTER?

   ANSWER: __________

   1 1 1 3 1 3 9 2 3 1 1 1
   25 2 200 4 3 25 20 200 5 50

A TEST OF KNOWLEDGE IS GIVEN ABOVE. THE ANSWER TO EACH QUESTION IS WRITTEN IN CODE UNDER THE QUESTION. TO DECODE:

Express any percent below as a fraction in lowest terms. Each time this fraction appears in the code, write the letter of that exercise above it.

KEEP WORKING AND YOU WILL DISCOVER THE ANSWER TO EACH QUESTION.

C 20% =

D 50% =

A 15% =

H 67% =

S 36% =

G 75% =

I 30% =

T 40% =

K 1% =

U 150% =

W 125% =

D 33 1/3% =

N 1/2% =

V 250% =

L 4% =

R 66 2/3% =

B 1/3% =

E 2% =
Important Consumer Information

Some important consumer information is hidden below. To find it, follow these directions.

*Find the percent of the word in each exercise below. As you find each percent, write the letters, in order, in the boxes at the bottom of the page. The first two letters have been filled in for you.*

1. The first 50% of COPE CO
2. The last 10% of CRYPTOGRAM —
3. The first 75% of PAST —
4. The last 40% of MOOSE —
5. The first 25% of SABOTAGE —
6. The first 60% of REACT —
7. The last \(33\frac{1}{3}\)% of EEL —
8. 100% of WAY —
9. The last 20% of MOTIONLESS —
10. The first 40% of OLIVE —
11. The first \(33\frac{1}{3}\)% of DWARFS —
12. The last \(66\frac{2}{3}\)% of PIT —
13. The first 5% of HYPERCHOLESTEROLEMIA —
14. The first 70% of COMPLETION —
15. The first 30% of EDITORSHIP —
16. The last 80% of ERECT —
17. The last 15% of INTERNATIONALIZATION —
18. The first 20% of SUPER —
What is the Title of This Picture?

TO DECODE THE TITLE OF THIS PICTURE:
Find a percent for any fraction below. Each time your answer appears in the code, write the letter of the exercise above it.

KEEP WORKING AND YOU WILL DECODE THE TITLE.

CODED TITLE:

72.3  230  45  72.3  15  4.25  45  40  150.5  70  230  230  7  26  84
167  2  75  150.5  150.5  7  2.5  70  7  150.5  167  75  1.5

E \( \frac{7}{10} = \frac{100}{\phantom{000}} \) = %
G \( \frac{21}{25} = \frac{100}{\phantom{000}} \) = %
I \( \frac{49}{700} = \frac{100}{\phantom{000}} \) = %
C \( \frac{723}{1000} = \frac{100}{\phantom{000}} \) = %

N \( \frac{13}{50} = \frac{100}{\phantom{000}} \) = %
R \( \frac{2}{5} = \frac{100}{\phantom{000}} \) = %
S \( \frac{3}{200} = \frac{100}{\phantom{000}} \) = %
W \( \frac{167}{100} = \frac{100}{\phantom{000}} \) = %

O \( \frac{9}{20} = \frac{100}{\phantom{000}} \) = %
H \( \frac{6}{300} = \frac{100}{\phantom{000}} \) = %
F \( \frac{17}{400} = \frac{100}{\phantom{000}} \) = %
L \( \frac{23}{10} = \frac{100}{\phantom{000}} \) = %

A \( \frac{3}{4} = \frac{100}{\phantom{000}} \) = %
K \( \frac{75}{500} = \frac{100}{\phantom{000}} \) = %
M \( \frac{30}{1200} = \frac{100}{\phantom{000}} \) = %
T \( \frac{301}{200} = \frac{100}{\phantom{000}} \) = %
What did the Ape think of the Grape's house?

CIRCLE the BEST ESTIMATE for each exercise without computing the actual answer. Write the letter of the best estimate in the box at the bottom of the page that contains the exercise number.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Calculation</th>
<th>Best Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>( \frac{5}{8} \div )</td>
<td>(L) 40%</td>
</tr>
<tr>
<td></td>
<td>( \frac{7}{14} \div )</td>
<td>(S) 150%</td>
</tr>
<tr>
<td></td>
<td>( \frac{17}{12} \div )</td>
<td>(B) 70%</td>
</tr>
<tr>
<td></td>
<td>( \frac{19}{10} \div )</td>
<td>(M) 110%</td>
</tr>
<tr>
<td></td>
<td>( \frac{22}{20} \div )</td>
<td>(T) 140%</td>
</tr>
<tr>
<td>2</td>
<td>( \frac{6}{7} \div )</td>
<td>(F) 15%</td>
</tr>
<tr>
<td></td>
<td>( \frac{7}{15} \div )</td>
<td>(S) 45%</td>
</tr>
<tr>
<td></td>
<td>( \frac{13}{24} \div )</td>
<td>(R) 45%</td>
</tr>
<tr>
<td></td>
<td>( \frac{24}{45} \div )</td>
<td>(E) 55%</td>
</tr>
<tr>
<td></td>
<td>( \frac{55}{90} \div )</td>
<td>(H) 150%</td>
</tr>
<tr>
<td>3</td>
<td>( \frac{1}{9} \div )</td>
<td>(T) 10%</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{11} \div )</td>
<td>(Y) 1%</td>
</tr>
<tr>
<td></td>
<td>( \frac{26}{25} \div )</td>
<td>(N) 1%</td>
</tr>
<tr>
<td></td>
<td>( \frac{51}{50} \div )</td>
<td>(D) 11%</td>
</tr>
<tr>
<td>4</td>
<td>( \frac{27}{14} \div )</td>
<td>(S) 150%</td>
</tr>
<tr>
<td></td>
<td>( \frac{17}{12} \div )</td>
<td>(B) 70%</td>
</tr>
<tr>
<td></td>
<td>( \frac{19}{10} \div )</td>
<td>(M) 110%</td>
</tr>
<tr>
<td></td>
<td>( \frac{22}{20} \div )</td>
<td>(T) 140%</td>
</tr>
<tr>
<td>5</td>
<td>( \frac{6}{7} \div )</td>
<td>(F) 15%</td>
</tr>
<tr>
<td></td>
<td>( \frac{7}{15} \div )</td>
<td>(S) 45%</td>
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<td>( \frac{13}{24} \div )</td>
<td>(R) 45%</td>
</tr>
<tr>
<td></td>
<td>( \frac{24}{45} \div )</td>
<td>(E) 55%</td>
</tr>
<tr>
<td></td>
<td>( \frac{55}{90} \div )</td>
<td>(H) 150%</td>
</tr>
<tr>
<td>6</td>
<td>( \frac{1}{9} \div )</td>
<td>(T) 10%</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{11} \div )</td>
<td>(Y) 1%</td>
</tr>
<tr>
<td></td>
<td>( \frac{26}{25} \div )</td>
<td>(N) 1%</td>
</tr>
<tr>
<td></td>
<td>( \frac{51}{50} \div )</td>
<td>(D) 11%</td>
</tr>
<tr>
<td>7</td>
<td>( \frac{5}{8} \div )</td>
<td>(L) 40%</td>
</tr>
<tr>
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<td>( \frac{7}{14} \div )</td>
<td>(S) 150%</td>
</tr>
<tr>
<td></td>
<td>( \frac{17}{12} \div )</td>
<td>(B) 70%</td>
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<tr>
<td></td>
<td>( \frac{19}{10} \div )</td>
<td>(M) 110%</td>
</tr>
<tr>
<td></td>
<td>( \frac{22}{20} \div )</td>
<td>(T) 140%</td>
</tr>
<tr>
<td>8</td>
<td>( \frac{6}{7} \div )</td>
<td>(F) 15%</td>
</tr>
<tr>
<td></td>
<td>( \frac{7}{15} \div )</td>
<td>(S) 45%</td>
</tr>
<tr>
<td></td>
<td>( \frac{13}{24} \div )</td>
<td>(R) 45%</td>
</tr>
<tr>
<td></td>
<td>( \frac{24}{45} \div )</td>
<td>(E) 55%</td>
</tr>
<tr>
<td></td>
<td>( \frac{55}{90} \div )</td>
<td>(H) 150%</td>
</tr>
<tr>
<td>9</td>
<td>( \frac{1}{9} \div )</td>
<td>(T) 10%</td>
</tr>
<tr>
<td></td>
<td>( \frac{1}{11} \div )</td>
<td>(Y) 1%</td>
</tr>
<tr>
<td></td>
<td>( \frac{26}{25} \div )</td>
<td>(N) 1%</td>
</tr>
<tr>
<td></td>
<td>( \frac{51}{50} \div )</td>
<td>(D) 11%</td>
</tr>
<tr>
<td>10</td>
<td>55% of 18</td>
<td>(A) 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(E) 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(M) 15</td>
</tr>
<tr>
<td>11</td>
<td>89% of 25</td>
<td>(C) 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(S) 22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(H) 28</td>
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<tr>
<td>12</td>
<td>8% of 99</td>
<td>(H) 8</td>
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<td></td>
<td>(T) 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(L) 80</td>
</tr>
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<td>13</td>
<td>46% of 52</td>
<td>(O) 19</td>
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<tr>
<td></td>
<td></td>
<td>(A) 25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(E) 75</td>
</tr>
<tr>
<td>14</td>
<td>160% of 24</td>
<td>(S) 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(C) 30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(T) 37</td>
</tr>
<tr>
<td>15</td>
<td>51.5% of 21.2</td>
<td>(I) 11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(A) 15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(E) 30</td>
</tr>
<tr>
<td>16</td>
<td>205% of 48</td>
<td>(A) 24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(O) 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(R) 150</td>
</tr>
<tr>
<td>17</td>
<td>1.25% of 300</td>
<td>(H) 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(L) 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(E) 50</td>
</tr>
<tr>
<td>18</td>
<td>9.5% of 11</td>
<td>(N) 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(T) 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(R) 3</td>
</tr>
<tr>
<td>19</td>
<td>95% of 79</td>
<td>(P) 60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(W) 75</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(H) 82</td>
</tr>
<tr>
<td>20</td>
<td>74% of 4.2</td>
<td>(D) 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(S) 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(P) 5</td>
</tr>
<tr>
<td>21</td>
<td>103% of 57.4</td>
<td>(L) 56</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(F) 57</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(V) 58</td>
</tr>
</tbody>
</table>
Career Information

1. A TELEVISION REPAIRMAN IS SOMEBODY WHO...

71% 233% 9% 67% 9% 248% 233% 8% 3% 77% 9% 22% 53% 233%

2. A TAXIDERMIST IS SOMEBODY WHO...

77% 117% 38% 67% 117% 88% 233% 42% 173% 22% 53% 248% 3% 144% 233%

3. A TREE SURGEON IS SOMEBODY WHO...

6% 3% 7% 7% 71% 173% 173% 22% 9% 173% 38% 117% 7% 3% 83% 24%

AN IMPORTANT FACT ABOUT EACH OCCUPATION IS WRITTEN IN CODE UNDER THE OCCUPATION.
TO DECODE:
Express any fraction below as a percent, rounded to the nearest whole percent. Each time this percent
appears in the code, write the letter of that exercise above it. Keep working and you will decode
these three important facts.

\[
\begin{align*}
\boxed{G} \frac{5}{7} &= \boxed{S} \frac{2}{3} = \boxed{V} \frac{7}{8} = \boxed{D} \frac{23}{16} = \boxed{P} \frac{1}{13} \\
\boxed{N} \frac{3}{8} &= \boxed{Y} \frac{5}{12} = \boxed{B} \frac{24}{99} = \boxed{O} \frac{19}{11} = \boxed{T} \frac{2}{23} \\
\boxed{U} \frac{2}{9} &= \boxed{W} \frac{1}{18} = \boxed{C} \frac{27}{35} = \boxed{E} \frac{7}{3} = \boxed{L} \frac{9}{128} \\
\boxed{M} \frac{5}{6} &= \boxed{R} \frac{8}{15} = \boxed{A} \frac{7}{6} = \boxed{H} \frac{159}{64} = \boxed{I} \frac{3}{100} 
\end{align*}
\]
What Do You Call The Situation When Your Parachute Doesn’t Open?

Each quotient is given as it would appear on an 8-digit hand calculator. Use this information to express any fraction below as a percent rounded to the nearest tenth of a percent. Find your answer in the answer columns and notice the letter next to it. Write this letter in each box at the bottom of the page that contains the exercise number.

KEEP WORKING AND YOU WILL DISCOVER THE ANSWER TO THE TITLE QUESTION.

1. \(\frac{11}{12} = 0.9166666\) = ____%
2. \(\frac{19}{32} = 0.59375\) = ____%
3. \(\frac{11}{27} = 0.4074074\) = ____%
4. \(\frac{1}{16} = 0.0625\) = ____%
5. \(\frac{20}{23} = 0.8695652\) = ____%
6. \(\frac{1}{81} = 0.0123456\) = ____%
7. \(\frac{4}{3} = 1.3333333\) = ____%
8. \(\frac{49}{43} = 1.1395348\) = ____%
9. \(\frac{202}{75} = 2.6933333\) = ____%
10. \(\frac{247}{64} = 3.859375\) = ____%
11. \(\frac{1}{127} = 0.007874\) = ____%
12. \(\frac{11}{2000} = 0.0055\) = ____%
13. \(\frac{17}{12,500} = 0.00136\) = ____%

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Find the MESSAGE

TO FIND THE HIDDEN MESSAGE:
Each row across has 6 rectangles. Only 4 of them contain TRUE equations. Circle these 4 equations in each row.
Notice the number and letter above each equation that you have circled. The number tells you where to put the letter in the row of boxes at the bottom of the page. You will spell out an 8-word message.

<table>
<thead>
<tr>
<th>5-E</th>
<th>13-A</th>
<th>10-H</th>
<th>16-O</th>
<th>20-S</th>
<th>8-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>68% = 0.68</td>
<td>51% = 5.1</td>
<td>7% = 0.07</td>
<td>1% = 0.01</td>
<td>99% = 0.99</td>
<td>6% = 0.006</td>
</tr>
<tr>
<td>14-A</td>
<td>24-D</td>
<td>12-L</td>
<td>3-O</td>
<td>17-B</td>
<td>13-E</td>
</tr>
<tr>
<td>5% = 0.05</td>
<td>25% = 0.25</td>
<td>2% = 0.2</td>
<td>8% = 0.08</td>
<td>65% = 0.065</td>
<td>43% = 0.43</td>
</tr>
<tr>
<td>2-F</td>
<td>1-A</td>
<td>8-S</td>
<td>23-E</td>
<td>18-R</td>
<td>12-R</td>
</tr>
<tr>
<td>8.3% = 0.83</td>
<td>40% = 0.4</td>
<td>33.3% = 0.333</td>
<td>1.9% = 0.019</td>
<td>70% = 0.07</td>
<td>10% = 0.1</td>
</tr>
<tr>
<td>17-A</td>
<td>7-I</td>
<td>2-N</td>
<td>11-I</td>
<td>19-I</td>
<td>6-M</td>
</tr>
<tr>
<td>87.5% = 0.875</td>
<td>0.5% = 0.005</td>
<td>150% = 1.5</td>
<td>37.5% = 3.75</td>
<td>4.5% = 0.045</td>
<td>0.1% = 0.01</td>
</tr>
<tr>
<td>11-E</td>
<td>6-N</td>
<td>9-T</td>
<td>22-T</td>
<td>18-F</td>
<td>9-W</td>
</tr>
<tr>
<td>233% = 2.33</td>
<td>0.7% = 0.007</td>
<td>0.01% = 0.001</td>
<td>180% = 0.18</td>
<td>90% = 0.9</td>
<td>1.1% = 0.011</td>
</tr>
<tr>
<td>15-S</td>
<td>22-R</td>
<td>4-V</td>
<td>15-L</td>
<td>21-B</td>
<td>21-D</td>
</tr>
<tr>
<td>400% = 0.4</td>
<td>66.7% = 0.667</td>
<td>0.2% = 0.002</td>
<td>30% = 0.3</td>
<td>75% = 0.75</td>
<td>4% = 0.4</td>
</tr>
</tbody>
</table>

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hidden Message

Do each exercise and find your answers in the rectangle below. Look for the correct answers from left to right across the rectangle.

Shade in the boxes that contain correct answers. When you finish, there will be 31 boxes not shaded in.

Starting on the top line and working from left to right, print the 31 remaining letters in the boxes at the bottom of the page. A hidden message will appear!

| 1 | 21% of 69 = | 9 | 12.5% of 1.75 = |
| 2 | 47% of 17 = | 10 | 66.7% of 8.1 = |
| 3 | 75% of 85 = | 11 | 5.4% of 625 = |
| 4 | 8% of 248.1 = | 12 | 95% of 0.8 = |
| 5 | 10% of 16.6 = | 13 | 0.6% of 1234 = |
| 6 | 3.8% of 54 = | 14 | 0.25% of 6.16 = |
| 7 | 7.9% of 4 = | 15 | 0.1% of 129,995 = |

| B | L | O | T | S | O | F | T | E | N | M | Y | E | S | T | O | K | R | M | O | O | N | E | E |
| 0 | 3 | 1 | 6 | 9 | 0 | 0 | 1 | 5 | 4 | 3 | 6 | 3 | 7 | 5 | 4 | 6 | 1 | 2 | 9 | 9 | 9 | 5 | 8 |

| Y | T | H | E | N | S | H | E | A | C | H | O | T | B | E | L | L | S | T | A | R | H | A |
| 0 | 9 | 1 | 4 | 9 | 3 | 5 | 0 | 2 | 1 | 8 | 7 | 5 | 8 | 2 | 0 | 5 | 2 | 6 | 0 | 8 | 7 |

| S | E | L | L | A | U | A | F | I | N | E | S | U | R | E | A | T | R | A | P | P | L | A | Y |
| 9 | 1 | 9 | 8 | 4 | 8 | 6 | 1 | 3 | 3 | 7 | 5 | 1 | 9 | 7 | 9 | 5 | 5 | 4 | 0 | 2 | 7 | 8 |

| G | O | E | S | A | D | M | O | V | I | N | G | E | T | S | A | S | H | E | T | I | O | N | R |
| 2 | 4 | 1 | 6 | 6 | 4 | 3 | 9 | 0 | 6 | 9 | 5 | 5 | 7 | 0 | 7 | 6 | 3 | 3 | 7 | 4 | 0 | 4 | 4 |
Why Do Lovers Go To Horror Movies?

TO ANSWER THIS QUESTION:

Draw a straight line connecting each exercise with its correct answer. Each line will cross a number and a letter. The number tells you where to put the letter in the row of boxes at the bottom of the page.

88% of 15  ■  10  A  ■  0.2392
4% of 5.98  ■  12  H  ■  35
9 1/2% of 0.2 - 14  R  ■  3.885
100% of 35 - 19  E  ■  10  262.5
150% of 35 - 3  0  ■  5.04
105% of 3.7  - 8  18  D  ■  0.625
0.4% of 800  - 6  O  ■  13.2
37.5% of 8  - 17  V  ■  0.019
87 1/2% of 300 - 4  17  V  ■  3
180% of 9000  - 1  T  ■  0.6
200% of 49.5 - 2  17  V  ■  99.5
168% of 3  - 11  9  Y  ■  0.65
0.12% of 500  - 7  16  Y  ■  16,200
1000% of 9.95 - 11  9  Y  ■  52.5
3/4% of 0.9  - 5  15  S  ■  0.00625
130% of 0.5  - 15  S  ■  0.0625
2 1/2% of 25  - 13  L  ■  3.2
1/4% of 2.5  - 6  O  ■  99
0.01% of 625 - 19  6  O  ■  0.00675

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

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DIRECTIONS:
Use the information given in the chart to figure out the missing values, each of which is indicated by a letter. Round the values to the nearest cent. Find each answer in the code and write the corresponding letter above it.

<table>
<thead>
<tr>
<th>ARTICLE ON SALE</th>
<th>ORIGINAL PRICE</th>
<th>PERCENT DISCOUNT</th>
<th>SALE PRICE</th>
<th>PERCENT SALES TAX</th>
<th>TOTAL AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATCH</td>
<td>$50</td>
<td>10%</td>
<td>D</td>
<td>6%</td>
<td>H</td>
</tr>
<tr>
<td>CALCULATOR</td>
<td>$45</td>
<td>25%</td>
<td>E</td>
<td>4%</td>
<td>Y</td>
</tr>
<tr>
<td>BICYCLE</td>
<td>$110</td>
<td>20%</td>
<td>U</td>
<td>5%</td>
<td>N</td>
</tr>
<tr>
<td>TYPEWRITER</td>
<td>$99.00</td>
<td>15%</td>
<td>W</td>
<td>6%</td>
<td>S</td>
</tr>
<tr>
<td>TENNIS RACKET</td>
<td>$59.90</td>
<td>10%</td>
<td>M</td>
<td>4%</td>
<td>R</td>
</tr>
<tr>
<td>TURNTABLE</td>
<td>$88.50</td>
<td>30%</td>
<td>A</td>
<td>$5\frac{1}{2}$%</td>
<td>P</td>
</tr>
<tr>
<td>CAMERA</td>
<td>$78</td>
<td>$33\frac{1}{3}$%</td>
<td>L</td>
<td>$4\frac{1}{2}$%</td>
<td>T</td>
</tr>
<tr>
<td>CASSETTE DECK</td>
<td>$84.95</td>
<td>40%</td>
<td>O</td>
<td>5%</td>
<td>C</td>
</tr>
</tbody>
</table>

THE WITTY RAINDROP SAID:

$54.34 \quad \$84.15 \quad \$50.97 \quad \$89.20 \quad \$53.52 \quad \$50.97 \quad \$53.91 \quad \$65.36 \quad \$61.95 \quad \$92.40 \quad \$35.10$

$61.95 \quad \$92.40 \quad \$45 \quad \$54.34 \quad \$47.70 \quad \$56.07 \quad \$33.75 \quad \$33.75 \quad \$89.20$

$61.95 \quad \$53.52 \quad \$52 \quad \$50.97 \quad \$88 \quad \$45$
HEXAGON CODE

Figure out the interest on any loan described below. Find your answer in the answer column and notice the design next to it. Each time this design appears in the coded message, write the letter of the exercise above it. Keep working and you will decode the message.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Loan Amount</th>
<th>Rate</th>
<th>Time</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>$500</td>
<td>12%</td>
<td>1</td>
<td>$36.75</td>
</tr>
<tr>
<td>A</td>
<td>$350</td>
<td>10.5%</td>
<td>1</td>
<td>$4.50</td>
</tr>
<tr>
<td>R</td>
<td>$975</td>
<td>9%</td>
<td>1</td>
<td>$140</td>
</tr>
<tr>
<td>T</td>
<td>$700</td>
<td>10%</td>
<td>2</td>
<td>$225</td>
</tr>
<tr>
<td>L</td>
<td>$1000</td>
<td>8%</td>
<td>2.5</td>
<td>$87.75</td>
</tr>
<tr>
<td>I</td>
<td>$375</td>
<td>12%</td>
<td>3</td>
<td>$19.50</td>
</tr>
<tr>
<td>O</td>
<td>$800</td>
<td>6.25%</td>
<td>4.5</td>
<td>$135</td>
</tr>
<tr>
<td>H</td>
<td>$150</td>
<td>1%</td>
<td>3</td>
<td>$25.35</td>
</tr>
<tr>
<td>G</td>
<td>$600</td>
<td>1.5%</td>
<td>6</td>
<td>$54</td>
</tr>
<tr>
<td>C</td>
<td>$520</td>
<td>0.75%</td>
<td>5</td>
<td>$60</td>
</tr>
<tr>
<td>N</td>
<td>$845</td>
<td>2%</td>
<td>1.5</td>
<td>$27.30</td>
</tr>
<tr>
<td>S</td>
<td>$1200</td>
<td>0.5%</td>
<td>3.5</td>
<td>$200</td>
</tr>
<tr>
<td>B</td>
<td>$182</td>
<td>1.25%</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

CRYPTIC MESSAGE

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Percents: Under 1—Over 100

Work any problem below and find your answer at the bottom of the page. Write the letter of the problem above it. Keep working and you will discover a message.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>A certain grass seed is guaranteed to contain no more than 0.15% weed</td>
<td>grams</td>
</tr>
<tr>
<td>seed. What is the greatest amount of weed seed expected in a 450 gram</td>
<td></td>
</tr>
<tr>
<td>box?</td>
<td></td>
</tr>
<tr>
<td>In the presidential election of 1888, only 0.8% of the popular votes</td>
<td>votes</td>
</tr>
<tr>
<td>separated the two candidates, Harrison and Cleveland. If 11,000,000</td>
<td></td>
</tr>
<tr>
<td>votes were cast, how many votes separated the candidates?</td>
<td></td>
</tr>
<tr>
<td>A steel rod expands 0.11% of its length when its temperature is</td>
<td>centimeters</td>
</tr>
<tr>
<td>increased to 100°C. How much longer will a 75 centimeter steel rod</td>
<td></td>
</tr>
<tr>
<td>become with this increase in temperature?</td>
<td></td>
</tr>
<tr>
<td>A certain fabric is guaranteed to shrink no more than 0.5% when washed.</td>
<td>meters</td>
</tr>
<tr>
<td>What is the maximum amount of shrinkage expected for a piece 0.5</td>
<td></td>
</tr>
<tr>
<td>meters long?</td>
<td></td>
</tr>
<tr>
<td>An ore is 0.65% pure gold. How many grams of gold are there in 10,000</td>
<td>grams</td>
</tr>
<tr>
<td>grams of ore?</td>
<td></td>
</tr>
<tr>
<td>A credit union lends money to its members at an interest rate of 0.75%</td>
<td></td>
</tr>
<tr>
<td>per month. What is the interest charge each month on a loan of $3500?</td>
<td>$</td>
</tr>
<tr>
<td>The profits of Burger Bonanza in a recent year were 125% of the</td>
<td>$</td>
</tr>
<tr>
<td>profits in the previous year. If the profits in the previous year were</td>
<td></td>
</tr>
<tr>
<td>$7000, what were the profits the next year?</td>
<td></td>
</tr>
<tr>
<td>In 1901 the Olds company built 425 cars. The next year, using mass</td>
<td>cars</td>
</tr>
<tr>
<td>production methods, the company built 600% of those built in 1901.</td>
<td></td>
</tr>
<tr>
<td>How many cars did the company build in 1902?</td>
<td></td>
</tr>
<tr>
<td>After 10 years, the price of a certain house was 205% of its original</td>
<td></td>
</tr>
<tr>
<td>price. If the house originally sold for $30,000, what did it sell for</td>
<td>$</td>
</tr>
<tr>
<td>10 years later?</td>
<td></td>
</tr>
<tr>
<td>Orgo borrowed $1700 to buy a used car. He had to pay back 133% of</td>
<td>$</td>
</tr>
<tr>
<td>what he had borrowed. How much did he have to pay back?</td>
<td></td>
</tr>
<tr>
<td>The human population of the world in the year 2000 is expected to be</td>
<td>billion</td>
</tr>
<tr>
<td>160% of the population in 1975. If the population in 1975 was 4.01</td>
<td></td>
</tr>
<tr>
<td>billion, what is the population expected in 2000?</td>
<td></td>
</tr>
<tr>
<td>The amount of money spent on education in the United States in 1977</td>
<td>$</td>
</tr>
<tr>
<td>was 650% of the amount spent in 1950. If $7.2 billion was spent in 1950, how much was spent in 1977?</td>
<td>billion</td>
</tr>
</tbody>
</table>
What is the Title of This Picture?

CODED TITLE:

5 30 25 150 400 20 50 10 175 60 175 30 20 80 44 175 60 25
50 400 175 200 33\(\frac{1}{3}\) 25 300 6 175 66\(\frac{2}{3}\) 12 66\(\frac{2}{3}\) 200 6 44 50 66\(\frac{2}{3}\)

TO DECODE THE TITLE OF THIS PICTURE, FOLLOW THESE INSTRUCTIONS:

Try to do these exercises mentally, using paper and pencil as little as possible. Do any exercise and find your answer in the coded title. Each time the answer appears, write the letter of that exercise above it.

KEEP WORKING AND YOU WILL DECODE THE TITLE.

O 20 is what % of 40?
E 8 is what % of 32?
N 15 is what % of 25?
M 43 is what % of 430?
I 9 is what % of 30?
H There are 50 states in the United States. Six states are in New England. What percent are in New England?

U 50 is what % of 25?
D 75 is what % of 25?
F 100 is what % of 25?
W 3 is what % of 2?
P 4 out of 5 is what %?

S 10 out of 30 is what %?
L 33 out of 75 is what %?
V What % of 40 is 2?
A What % of 4 is 7?
T What % of 18 is 12?

R An orchestra has 60 musicians. Twelve play woodwind instruments. What percent play woodwind instruments?

B The average American produces 2000 pounds of trash per year. This includes 120 pounds of bottles. What percent of the trash is bottles?
MYSTERY MESSAGE

Work each problem and find your answers in the rectangle. Cross out each box that contains a correct answer. When you finish, there will be 8 boxes not crossed out. Print the letters from these boxes in the boxes at the bottom of the page. The mystery message will appear.

1. $13 = \underline{\quad\%}$ of 16
2. $5 = \underline{\quad\%}$ of 12
3. $11 = \underline{\quad\%}$ of 8
4. 1 out of 45 = $\underline{\quad\%}$
5. 7 out of 32 = $\underline{\quad\%}$
6. 5 out of 6 = $\underline{\quad\%}$
7. $\underline{\quad\%}$ of 250 = 750
8. $\underline{\quad\%}$ of 51 = 85
9. $\underline{\quad\%}$ of 42 = 34

12. First year profits of a business were $900. Second year profits were $1200. What percent of the first year profits were the second year profits?

13. Men outnumber women in 5 out of the 50 states. In what percent of the states do women outnumber men?

14. The team won 16 games, lost 6 games, and tied 2 games. What percent of the games did they win?

15. The price of an item before tax was $48. The sales tax was $2.16. What percent tax was charged?

16. The player was at bat 200 times and made 61 hits. What percent were hits?

---

<table>
<thead>
<tr>
<th>SO</th>
<th>KI</th>
<th>LA</th>
<th>BA</th>
<th>LL</th>
<th>ME</th>
<th>SS</th>
<th>KE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2\frac{2}{9}</td>
<td>30\frac{1}{2}</td>
<td>166\frac{2}{3}</td>
<td>31\frac{3}{4}</td>
<td>90%</td>
<td>41\frac{2}{3}</td>
<td>4\frac{1}{2}</td>
<td>4\frac{1}{3}</td>
</tr>
<tr>
<td>AT</td>
<td>EA</td>
<td>RS</td>
<td>KN</td>
<td>OW</td>
<td>IT</td>
<td>ST</td>
<td>EA</td>
</tr>
<tr>
<td>21\frac{7}{8}</td>
<td>86\frac{2}{3}</td>
<td>78\frac{1}{4}</td>
<td>175%</td>
<td>77\frac{1}{3}</td>
<td>81\frac{1}{4}</td>
<td>300%</td>
<td>42\frac{1}{4}</td>
</tr>
<tr>
<td>MA</td>
<td>DD</td>
<td>ON</td>
<td>OU</td>
<td>TI</td>
<td>CH</td>
<td>GH</td>
<td>NG</td>
</tr>
<tr>
<td>80\frac{20}{21}</td>
<td>145%</td>
<td>83\frac{1}{3}</td>
<td>20\frac{1}{8}</td>
<td>66\frac{2}{3}</td>
<td>137\frac{1}{2}</td>
<td>81\frac{2}{3}</td>
<td>133\frac{1}{3}</td>
</tr>
</tbody>
</table>
Did You Hear About... 

A) The price of a hamburger at McBeef's increased from 50¢ to 60¢. What was the percent increase?

B) Fink's typing speed increased from 40 words per minute to 45 words per minute. What was the percent increase?

C) The number of crimes committed in Blinkville decreased from 10 crimes in May to only 4 crimes in June. What was the percent decrease?

D) The number of students attending Scholarly High School dropped from 1500 to 1300. What was the percent decrease?

E) A baby weighed 7.2 pounds at birth and 9.0 pounds at the age of one month. What was the percent increase?

F) During a sale, a 10-speed bike was marked down from $90 to $70. What was the percent discount?

G) Mr. Shift bought TNT stock at $30 per share and sold it at $45 per share. What was his percent profit?

H) Mr. Shaft bought IOU stock at $45 per share and sold it at $30 per share. What was his percent loss?

I) The estimated population of the world was 1.6 billion in 1900 and 4.0 billion in 1975. What was the percent increase?

J) To conserve energy a factory cut its use of electricity from 12,000 kilowatt-hours per month to 7000 kilowatt-hours per month. What was the percent decrease?

K) Orgo's salary jumped from $3.20 per hour to $3.40 per hour. What was his percent raise?

L) The number of subscribers to Playperson magazine rose from 400,000 to 1,300,000. What was the percent increase?

DIRECTIONS: Do any exercise below. Find your answer in the answer column and notice the word next to it. Write this word in the box that has the same letter as that problem.

KEEP WORKING AND YOU WILL HEAR ABOUT SOMEBODY WHO STOLE AWAY.

150%—AND
13 3/3%—WHO
37 1/2%—FAST
22 2/9%—ON
6 1/4%—A
5 1/2%—FORTUNE
33 3/3%—SCALE
20%—THE
22 3/4%—DOWN
43 1/3%—POUNDS
60%—ROBBER
41 2/3%—GOT
50%—A
28%—TRIED
12 1/2%—BANK
240%—BUCK
225%—WEIGH
162%—UNTIL
25%—STEPPED
55%—SOME

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How's Business?

BOXER: "Mine is ____________________________ ."
100 
72 
780 
25 
25 
80 
100 
200

SAILOR: "Mine is ____________________________ ."
36 
90 
60 
50 
130 
40 
198

TAXI DRIVER: "Mine is ____________________________ ."
12 
40 
70 
75 
18 
780 
100 
50 
12 
40 
70 
75

CIGAR MAKER: "Mine is ____________________________ ."
70 
75 
40 
72 
72 
24 
40 
198 
70 
40 
25

Each person above is answering the question, "How's business?"

To decode their answers, follow these instructions:

Do any exercise and find your answer in the code. Each time the answer appears, write the letter of that exercise above it. Keep working and you will decode the four punny answers.

H 25% of what number is 50?
U 10% of what number is 78?
B 50% of what number is 65?
E 20% of what number is 15?
I 75% of what number is 60?
T 90% of what number is 45?
O 40% of what number is 24?
L 100% of what number is 72?
K 200% of what number is 72?
Y 300% of what number is 72?
J 400% of what number is 72?
D 99 is 50% of what number?
R 105 is 150% of what number?
F 30 is 250% of what number?
N 72 is 80% of what number?
G 125 is 500% of what number?
A 2 is 5% of what number?
S 77 is 77% of what number?
Cryptic Quiz

1. WHO INVENTED THE FIRST AIRPLANE THAT DIDN'T FLY?
   ANSWER: 
   800  40  400  15  350  30,000  3500  134
   
   25  350  30,000  800  40  400  350  6

2. WHAT HAPPENED TO THE GUY WHO LOST THE PIE-EATING CONTEST?
   ANSWER: 
   40  400  2000  300  50,000  400  3080  3500
   
   6  3080  2000  120  400  3500  400  2275

TO DECODE THE ANSWERS TO THESE TWO QUESTIONS:
Work any problem below and find your answer in the code. Each time the answer appears, write the letter of that problem above it. Keep working and you will decode the two answers.

A  15% of ____ = 45
T  560 = 70% of ____
D  8% of ____ = 182
H  72 = 180% of ____
G  150% of ____ = 201
I  2772 = 90% of ____
M  0.5% of ____ = 250
W  6.75 = 45% of ____
S  225% of ____ = 13.5
K  9 = 7\frac{1}{2}% of ____

O  A salesman earns 5% of his sales as a commission. How much does he have to sell to earn $1500?
   ANSWER: $_______

B  A certain type of fertilizer contains 8% nitrogen. If 2 kilograms of nitrogen are needed to fertilize a lawn, how many kilograms of fertilizer are needed?
   ANSWER: ____ kilograms

N  Profits of Caicules Corporation this year were 140% of profits last year. If profits this year were $4900, what were profits last year?
   ANSWER: $____

C  An ore is \( \frac{1}{2} \) pure silver. How much ore is needed to obtain 30 kilograms of silver?
   ANSWER: ____ kilograms

E  Safe Side Savings and Loan pays \( \frac{1}{3} \) % interest per year on savings. How much money must be put into an account to earn $21 annually?
   ANSWER: $____

R  A scale drawing of an elephant is 1% of actual size. If the drawing is 3.5 centimeters high, what is the actual height of the elephant?
   ANSWER: ____ centimeters
What is the Title of This Picture?

CODED TITLE:

99 6.9 11.96 11.5 72 11.5 89 50 11.9 85 99 20.4

85 11.96 99 11.96 85 20.4 89 11.5 11.9 12 75 85 4

99 11.5 30 24 20.4

TO DECODE THE TITLE OF THIS PICTURE:
Figure out what number should go in the blank in any exercise below. Each time this number appears in the code, write the letter of that exercise above it.

KEEP WORKING AND YOU WILL DECODE THE TITLE.

O 23% of 52 = ____  H 9% of ____ = 4.5  N 51 out of 60 = ____%
R 12 = ____% of 40  A 70% of 17 = ____
L 25% of ____ = 18  G 12 = ____% of 300
S 6% of 340 = ____  M 55% of ____ = 13.2
I 15 = ____% of 20  W 92% of 7.5 = ____
K 67% of ____ = 8.04
E 1% of 1150 = ____
P 89 out of 100 = ____%
T 50% of ____ = 49.5
Career Information

Information about a certain career is given in code at the bottom of the page. To decode:

Figure out what number should go in the blank in any exercise below. Find your answer in the answer columns and notice the number next to it. Each time this number appears in the code, write the letter of the exercise above it. Keep working and you will decode this important career information.

\[ \begin{array}{cc}
K & 70\% \text{ of } 280 = \_ \\
V & 9 \text{ out of } 20 = \_ \% \\
O & 15\% \text{ of } \_ = 30 \\
A & 7\% \text{ of } 64 = \_ \\
X & 1 \text{ out of } 6 = \_ \% \\
I & 75\% \text{ of } \_ = 39 \\
S & 150\% \text{ of } 96 = \_ \\
D & 8 \text{ out of } 15 = \_ \% \\
R & 2\% \text{ of } \_ = 9 \\
C & 5\frac{1}{2} \% \text{ of } 800 = \_ \\
L & 12 = \_ \text{ \% of } 160 \\
V & 99 = 110\% \text{ of } \_ \\
H & 0.1\% \text{ of } 880 = \_ \\
T & 14 = \_ \text{ \% of } 8 \\
W & 48 = 16\% \text{ of } \_ \\
E & 37\frac{1}{2} \% \text{ of } 6 = \_ \\
P & 3.5 = \_ \text{ \% of } 28 \\
N & 7 = 400\% \text{ of } \_ \\
\end{array} \]

\[ \begin{array}{ll}
7 & 16 \quad 17 \quad 9 \quad 11 \quad 14 \quad 16 \quad 3 \quad 4 \quad 9 \quad 3 \quad 6 \quad 2 \quad 3 \quad 9 \quad 1 \quad 9 \quad 3 \quad 10 \\
12 & 15 \quad 15 \quad 9 \quad 8 \quad 5 \quad 9 \quad 3 \quad 12 \quad 9 \quad 15 \quad 18 \quad 9 \quad 13 \\
\end{array} \]

\[ \begin{array}{ll}
1 & 90 \\
2 & 4.48 \\
3 & 450 \\
4 & 196 \\
5 & 12\frac{1}{2} \\
6 & 144 \\
7 & 0.88 \\
8 & 16\frac{2}{3} \\
9 & 2.25 \\
10 & 45 \\
11 & 7\frac{1}{2} \\
12 & 52 \\
13 & 53\frac{1}{3} \\
14 & 300 \\
15 & 1.75 \\
16 & 200 \\
17 & 175 \\
18 & 44 \\
\end{array} \]
What Do You Call a Knife That Cuts Four Loaves of Bread at Once?

Work any problem below and find your answer in the answer column. Notice the letter next to it. This letter goes in each box at the bottom of the page that contains the problem number.

KEEP WORKING AND YOU WILL DISCOVER THE ANSWER TO THE TITLE QUESTION.

1. A person standing on Mars would weigh 38% of his earth weight. What is the Mars weight of a person with an earth weight of 55 kilograms?

2. If a person who weighs 70 kilograms has a brain that weighs 1.4 kilograms, what percent of the person's body weight is brain?

3. Students at one school sell magazine subscriptions to raise money for athletic equipment. The school keeps 20% of sales. How many dollars' worth of subscriptions must be sold to make $1500?

4. A ship model is 0.5% of actual size. If the model is 1 meter long, what is the actual length of the ship?

5. Escape velocity is the speed necessary to escape the gravitational pull of a planet. The escape velocity of Earth is 11.3 kilometers per second, while the escape velocity of Saturn is 310% of that. What is the escape velocity of Saturn?

6. The body of a person who weighs 50 kilograms consists of 32.5 kilograms of oxygen, 9 kilograms of carbon, 5 kilograms of hydrogen, and 3.5 kilograms of other elements. What percent of the person's body weight is oxygen?

7. Of the babies born in America 51.2% are boys. If 3000 babies are born in a certain hospital this year, what is the expected number of boys?

8. A salesman keeps 8% of his sales as a commission. How much does he have to sell to earn $20,000?

9. Mr. D.J. Average bought a stock at $30 per share and sold it at $37 per share. What percent profit did he make?

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PRE-ALGEBRA WITH PIZZAZZ!
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### How Did the Dinosaur Feel Just Before the Big Math Test?

Work each problem and select the correct answer from the two choices given. Write the letter of the correct choice in each box at the bottom of the page that contains the problem number.

<table>
<thead>
<tr>
<th></th>
<th>A &quot;day&quot; on Saturn is 42.6% of a day on earth. How many hours are there in a day on Saturn?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(N) 10.224 hours</td>
<td>(L) 11.124 hours</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>In the presidential election of 1860, 39.9% of the voters voted for Abraham Lincoln and 29.4% of the voters voted for Stephen Douglas. What percent voted for other candidates?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>(K) 32.7%</td>
<td>(U) 30.7%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Bowser's dog food is 40% meat. How much dog food must Bowser eat in order to get ( \frac{3}{2} ) kilograms of meat?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>(E) 3.7 kilograms</td>
<td>(A) 3.75 kilograms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Tropical Trip punch is made by mixing 4 liters of pineapple juice, 5 liters of orange juice, and 3 liters of ginger ale. What percent of Tropical Trip is orange juice?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>(W) 41.7%</td>
<td>(C) 40.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Mr. J. Doe has a taxable income of $9000. If the income tax rate is 16% on the first $4000 of income, 19% on the next $4000, and 22% on the next $1000, how much is Mr. Doe's tax?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>(T) $1580</td>
<td>(H) $1620</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>The human body is 65% oxygen, 18% carbon, 10% hydrogen, 3% nitrogen, 1% calcium, and 1% phosphorus; the rest is other elements. What percent is composed of other elements?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>(O) 1.5%</td>
<td>(L) 4.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Magnificent Marble Makers make red marbles, white marbles, and blue marbles. One week they made 45% red marbles, 17% white marbles, and the rest blue marbles. If they made 456 blue marbles, how many marbles did they make in all?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>(X) 1200</td>
<td>(F) 1050</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Suzi Everthrift spent 20% of her savings, but still had $26. How much money had Suzi saved originally?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>(S) $32.50</td>
<td>(R) 31.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Osgood missed 8 out of 30 problems on a math test. What percent of the problems did he get correct?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>(M) 75.6%</td>
<td>(V) 73.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>The Stegosaurus dinosaur weighed about 2000 kilograms. The weight of his brain was only 0.004% of the weight of his body. How much did the Stegosaurus brain weigh?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>(E) 0.08 kilograms</td>
<td>(I) 0.8 kilograms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Herman Buckets made 19 field goals in 32 attempts. What was his shooting percentage?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>(T) 59.9%</td>
<td>(R) 59.4%</td>
</tr>
</tbody>
</table>
What Did The Girl Rock Say To The Boy Rock?

Find the answer to any question below in the code key. Notice the letter next to it. Print this letter in the box at the bottom of the page that contains the problem number. Keep working and you will discover the answer to the title question.

1. If a coin is tossed, what is the probability of getting a head?
2. If a coin is tossed, what is the probability of getting a tail?
3. Suppose a coin is tossed 100 times. About how many times would you expect to get heads?
4. Suppose you roll a regular 6-faced die. What is the probability of rolling:
   a 6?      a 2?      a 4?
5. Suppose you roll a 6-faced die 90 times. About how many times would you expect to get a 5?
6. Suppose a jar contains 5 red marbles, 4 white marbles, and 3 blue marbles. If a marble is drawn at random from the jar, what is the probability that it is:
   red?      white?      blue?
7. A spinner is pictured at the right. If the arrow is spun, what is the probability that the spinner lands on:
   2?      3?      5?
   an even number?
   a number less than 3?
8. Suppose the arrow is spun 50 times. About how many times would you expect the spinner to land on an odd number?
Why Are Oysters Greedy?

Find the answer to any question below in the boxes at the bottom of the page. Write the letter of that question in the box above its correct answer. Keep working and you will discover the answer to the title question.

Suppose that a card is drawn at random from the 12 cards shown at the right. What is the probability that the card is:

- E striped?
- T shaded?
- I white?
- E numbered 10?
- L either striped or shaded?
- E either white or striped?
- S either white or numbered 5?
- R either numbered 3 or numbered 9?

A spinner is shown at the right. If the arrow is spun, what is the probability that it will stop on a region that is:

- H striped?
- L either white or shaded?
- A either striped or numbered 7?
- Y either numbered 6 or numbered 3?
- S numbered 4?
- H not numbered 4?
- F not shaded?
- H either striped or shaded or numbered 7?
What Is Long And Yellow And Never Rings?

Find the answer to any question below in the boxes at the bottom of the page. Write the letter of that question in the box above its correct answer. Keep working and you will discover the answer to the title question.

A spinner is shown at the right. If the arrow is spun, what is the probability that it will stop on:

- A multiple of 3?
- A multiple of 2?
- A multiple of 3 and a multiple of 2?
- A multiple of 3 or a multiple of 2?

Suppose that one card is drawn at random from the 12 cards shown at the right. What is the probability that the card is:

- White?
- Numbered with a multiple of 3?
- White and numbered with a multiple of 3?
- White or numbered with a multiple of 3?
- Shaded?
- Numbered with a number less than 10?
- Shaded and numbered with a number less than 10?
- Shaded or numbered with a number less than 10?

Pink and Purple Car Company owns the following cars: 1 pink Ford, 4 pink Chevrolets, 5 purple Fords, and 3 purple Chevrolets. If one of these cars is chosen at random, what is the probability that it is:

- A Ford?
- A pink?
- Pink and a Ford?
- Pink or a Ford?
What Did The Electrician Say When His Son Came Home Late?

TO ANSWER THIS QUESTION, FOLLOW THESE INSTRUCTIONS: This puzzle contains 15 blocks of information and questions, called FRAMES. Read the frames in order. For each frame, select the correct answer from the two choices given. Write the letter of the correct choice in the box at the bottom of page 2 that contains the frame number.

1. Suppose you toss two coins at the same time. There is a certain probability of getting two heads. Or, suppose you roll two dice. There is a certain probability of getting a total of 7. This puzzle will help you figure out these probabilities.
   First, let’s consider tossing coins. How many outcomes are possible if you toss one coin?
   (I) 2 outcomes (R) 4 outcomes

2. The answer to the first frame is, of course, 2 outcomes. If you toss one coin, you get either a head or a tail. Each of these outcomes is EQUALLY LIKELY—that is, each will happen about as often as the other.
   When you toss a coin, the probability of getting a head is 1 out of 2, or:
   (E) \( \frac{1}{2} \) (L) \( \frac{1}{3} \)

3. Suppose you toss a penny and a dime together. How many EQUALLY LIKELY outcomes are there? You might guess there are three: 2 heads; 2 tails; 1 head and 1 tail.
   This is incorrect. Actually, there are FOUR equally likely outcomes. They are listed at the right.
   Now, answer the question. How many equally likely outcomes are there when you toss a penny and a dime?
   (A) 5 (S) 4

4. One outcome is getting 2 heads. Another outcome is getting 2 tails.
   The third outcome is getting penny heads and dime tails. The fourth outcome is getting penny tails and dime heads.
   Since getting two heads is 1 of 4 equally likely outcomes, what is the probability of getting two heads?
   (I) \( \frac{1}{4} \) (M) \( \frac{1}{2} \)

5. What is the probability of getting two tails? (S) \( \frac{1}{5} \) (E) \( \frac{1}{4} \)

6. The answer to both questions 4 and 5 is, of course, \( \frac{1}{4} \). Now, what is the probability of getting 1 head and 1 tail? Remember, there are TWO WAYS to do this: penny heads and dime tails; penny tails and dime heads. So the probability is 2 out of 4, or:
   (E) \( \frac{1}{5} \) (O) \( \frac{1}{2} \)

7. If the probability of getting 1 head and 1 tail is \( \frac{1}{2} \), then if you toss 2 coins together 100 times, about how many times would you expect to get 1 head and 1 tail?
   (T) 30 (A) 50
The method we used for the coin problem has two steps: (1) listing all equally likely outcomes; and (2) seeing how many of these outcomes are in the EVENT we are talking about. An EVENT is a certain subset of outcomes, like getting 1 head and 1 tail.

Let's apply this method to dice rolling. How many equally likely outcomes are there if you roll 1 regular 6-faced die?

\[
\begin{array}{ccc}
(U) & 6 & (R) 4 \\
(1,1) & (1,2) & (1,3) & (1,4) & (1,5) & (1,6) \\
(2,1) & (2,2) & (2,3) & (2,4) & (2,5) & (2,6) \\
(3,1) & (3,2) & (3,3) & (3,4) & (3,5) & (3,6) \\
(4,1) & (4,2) & (4,3) & (4,4) & (4,5) & (4,6) \\
(5,1) & (5,2) & (5,3) & (5,4) & (5,5) & (5,6) \\
(6,1) & (6,2) & (6,3) & (6,4) & (6,5) & (6,6) \\
\end{array}
\]

Suppose you roll two dice, 1 red and 1 green. We can make a chart to see all equally likely outcomes. This chart is at the right. The first number in each pair is on the red die; the second number is on the green die.

By counting the number of pairs, you discover how many equally likely outcomes there are. How many are there?

\[
\begin{array}{ccc}
(S) 32 & (Y) 36 \\
\end{array}
\]

Usually when you roll two dice, you are interested in the SUM of the two numbers you get. For example, red 1 and green 4 adds up to 5. But there are actually FOUR different ways to get a sum of 5: (red 1, green 4); (red 2, green 3); (red 3, green 2); (red 4, green 1).

So, of the 36 equally likely outcomes, four of them are sums of 5.

The probability of getting 5 is 4 out of 36, or:

\[
\begin{array}{ccc}
(T) \frac{1}{9} & (R) \frac{1}{7} \\
\end{array}
\]

There is only one way to get a sum of 2. (Both dice have to come up 1.)

So the probability of getting 2 is:

\[
\begin{array}{ccc}
(L) \frac{1}{36} & (H) \frac{5}{36} \\
\end{array}
\]

How many of the 36 outcomes are sums of 10? The probability of getting 10 is:

\[
\begin{array}{ccc}
(F) \frac{1}{6} & (N) \frac{1}{12} \\
\end{array}
\]

The probability of getting 8 is:

\[
\begin{array}{ccc}
(R) \frac{5}{36} & (T) \frac{7}{36} \\
\end{array}
\]

The probability of getting 7 is:

\[
\begin{array}{ccc}
(F) \frac{1}{4} & (W) \frac{1}{6} \\
\end{array}
\]

The method we used for both the coin problem and the dice problem has two steps. These two steps are: (1) listing all equally likely outcomes; and (2) seeing how many of those outcomes are:

\[
\begin{array}{ccc}
(U) \text{ in the event we are talking about.} \\
(G) \text{ not in the event we are talking about.} \\
\end{array}
\]

14 13 12 9 6 8 4 15 11 7 10 5
Why Don’t We Wear Paper Clothes?

Find the answer to any question below in the code key. Notice the letter next to it. Print this letter in the box at the bottom of the page that contains the problem number. Keep working and you will discover the answer to the title question.

Suppose a coin is tossed 3 times. What is the probability of:

1. getting 3 heads?
2. getting 3 tails?
3. getting ANY particular outcome (such as head, tail, tail)?

Suppose a coin is tossed 4 times. What is the probability of:

4. getting 4 heads?
5. getting any particular outcome?
6. Suppose you toss a coin 4 times and get 4 heads. What is the probability of getting a head on the 5th toss?
7. Suppose you toss a coin 10 times and get 10 tails. What is the probability of getting a tail on the 11th toss?

Suppose a jar contains 3 red marbles and 2 white marbles. If a marble is drawn at random, what is the probability it is red?

Suppose a jar contains 3 red marbles and 2 white marbles. If one marble is drawn at random, then replaced, and then another marble is drawn at random, what is the probability of:

9. drawing a red marble on both draws?
10. drawing a red marble, then a white marble?
11. drawing a white marble on both draws?
12. drawing a white marble, then a red marble?

The spinner at the right is designed so that \( P(A) = \frac{1}{2}, \ P(B) = \frac{1}{4}, \ \text{and} \ P(C) = \frac{1}{4}. \) If the arrow is spun twice, what is the probability of the spinner landing on:

13. A on both spins?
14. A, then B?
15. B on both spins?

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ON THE BUTTON

TO DECODE THE BUTTON:
Solve any equation at the right and find the solution around the rim of the button. Each time the solution appears on the button, write the letter of that equation above the solution. Keep working and you will decode the button.

\[ \begin{align*}
\text{E} & : 4! = n \\
\text{A} & : 5! = n \\
\text{N} & : 7! = n \\
\text{I} & : 3!4! = n \\
\text{S} & : 2!5! = n \\
\text{R} & : 6 \cdot 5! = n \\
\text{H} & : 11 \cdot 10! = n \\
\text{L} & : 9 \cdot 8 \cdot 7! = n \\
\text{U} & : \frac{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{3 \cdot 2 \cdot 1} = n \\
\text{M} & : \frac{6!}{4!} = n \\
\text{T} & : \frac{7!}{6!} = n \\
\text{F} & : \frac{8!}{5!} = n \\
\text{O} & : \frac{6!}{4!2!} = n \\
\text{Z} & : \frac{9!}{6!3!} = n \\
\text{W} & : \frac{7!}{2!5!} = n \\
\text{D} & : \frac{5!}{3!2!} = n
\end{align*} \]
DIRECTIONS:
Figure out the answer to any question below. Then find your answer in the coded line at the bottom of the page.
Each time the answer appears in the code, write the letter of that question above it.

KEEP WORKING AND YOU WILL DECODE THE LINE.

<table>
<thead>
<tr>
<th>A</th>
<th>How many arrangements of the letters M, A, T, and H are possible if each letter can be used only once in each arrangement?</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Six people are to be seated in a row of six chairs. How many different seating arrangements are possible?</td>
</tr>
<tr>
<td>D</td>
<td>There are 3 roads connecting Towns A and B, and 4 roads connecting Towns B and C. How many different routes are there from Town A to Town C?</td>
</tr>
<tr>
<td>O</td>
<td>The GT Dragger offers 5 different engines, 4 different paint jobs, and 2 different radios. How many different &quot;packages&quot; are possible?</td>
</tr>
<tr>
<td>I</td>
<td>How many different batting orders are possible for the 9 men on a baseball team?</td>
</tr>
<tr>
<td>V</td>
<td>Orgo has 5 pairs of pants, 6 sport shirts, and 3 belts. How many different outfits can he make using these items?</td>
</tr>
<tr>
<td>L</td>
<td>How many different 2-letter arrangements can be selected from the set {S,H,A,R,K}?</td>
</tr>
<tr>
<td>P</td>
<td>How many 3-letter arrangements are possible using the 26 letters of the alphabet if no letter can be used more than once?</td>
</tr>
<tr>
<td>R</td>
<td>If a school offers 9 different subjects, how many different schedules of 5 classes are possible?</td>
</tr>
<tr>
<td>C</td>
<td>In how many different ways can a president, vice president, and secretary be elected from a class of 22 students?</td>
</tr>
<tr>
<td>E</td>
<td>How many different 4-digit numerals are there? (Hint: zero cannot be used as the first digit.)</td>
</tr>
</tbody>
</table>

**TITLE: BIG DRIPS**

<table>
<thead>
<tr>
<th>362,880</th>
<th>9240</th>
<th>362,880</th>
<th>9240</th>
<th>20</th>
<th>9000</th>
<th>720</th>
<th>24</th>
<th>15,120</th>
<th>9000</th>
</tr>
</thead>
<tbody>
<tr>
<td>9000</td>
<td>24</td>
<td>90</td>
<td>9000</td>
<td>720</td>
<td>12</td>
<td>15,120</td>
<td>40</td>
<td>15,600</td>
<td>15,600</td>
</tr>
</tbody>
</table>

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Combination Code

Figure out the number of COMBINATIONS for any problem below. Find your answer in the code at the bottom of the page. Each time the answer appears in the code, write the letter of that problem above it. Keep working and you will decode the message.

R 5 objects taken 3 at a time  T 7 objects taken 2 at a time
O 4 objects taken 2 at a time  L 5 objects taken 5 at a time
F 6 objects taken 4 at a time  D 9 objects taken 6 at a time

N How many committees of 3 members can be formed from 6 people?
S How many committees of 2 members can be formed from 8 people?
G A student must work any 4 of the 5 problems on a math quiz. How many different selections of problems can be made?
I A basketball team has 8 players. How many different 5-man teams are possible if each player can play any position?
P Thumba likes to wear 2 rings, one on each thumb. If she has 9 rings to choose from, how many combinations are possible?
F Gorgeous Gertrude has 7 boy friends. If she can see only 3 of them on a weekend, how many different combinations could she see?
C A student may choose to read any 4 books from a list of 8 books. How many choices does the student have?
H In the year 2525, astronauts Milky and Way are blasting around the solar system. If they decide to visit 5 of the 9 planets, how many different selections could they make?
A Mergatroid has just enough money to buy 2 candy bars. If there are 10 kinds to choose from, how many choices does she have?

TITLE: EVEN ODDS

70 6 56 20 35 1 56 36 36 15 10 28 70 45 20 5 15 21 45 126 15 45 84
Test of Genius

1. Which of the four figures below should go in the empty box above?

2. Tom, Dick, and Harry work in a bank. One is the manager, one is the cashier, and one is the teller.

   The teller, who was an only child, earns the least.

   Harry, who married Tom's sister, earns more than the manager.

   What position does each man fill?

3. Two boys weighing 100 pounds each and a man weighing 200 pounds wish to cross a river. Their boat will hold only 200 pounds safely. How can they cross the river in the boat?

4. You have your choice of one of the four pets above. You are told that white squares eat more than white circles, black squares eat more than white squares, and black squares eat less than black circles. Which pet would be cheapest to feed?

5. Arrange nine dots in such a way that you have 8 rows with 3 dots in each row.

6. Try to put the numbers 1 to 12 in the twelve boxes below so that the numbers along each side add to 26.

7. A clock takes 4 seconds to strike 5 o'clock. How long will it take to strike 10 o'clock? (Hint: The answer is not 8 seconds.)

8. John, Jack, Jim, and Joe all decided to take up horseback riding. Jim went twice as many times as Jack, and John went four more times than Joe but three less times than Jim. Joe went 15 times altogether. How many times did Jack go?

9. Gear X has 12 cogs (teeth) and turns clockwise at 30 revolutions per minute. Gear Y has 24 cogs and gear Z has 6 cogs.

   How fast and in which direction does gear Z turn?

SCORING KEY

8 or 9 -- Superstar Genius
6 or 7 -- Star Genius
4 or 5 -- Genius
3 or less -- Genius of the Future
Why is a Leaky Faucet Like a Race Horse?

TO ANSWER THE IMPORTANT QUESTION ABOVE:

Complete any statement below with one of the answers given at the bottom of the page. Then write the letter of the statement above its correct answer.

KEEP WORKING AND YOU WILL DISCOVER THE ANSWER.

A The figure formed by two rays with the same endpoint is an _____.
B The basic unit by which angles are measured is the _______.
C The intersection of the two sides of an angle is called the angle’s _______.
D The small box at the vertex of ∠AOB indicates that ∠AOB measures _______.
E An angle with a measure of 90° is called a _____ angle.
F Point C is in the _________ of ∠BOD.
G An angle whose measure is between 90° and 180° is an _______ angle.
H Two angles whose measures have a sum of 90° are ________________ angles.
I ∠BOC and ∠BOA are ________ angles.
J Two angles whose measures have a sum of 180° are ________________ angles.
K An angle whose measure is between 0° and 90° is an _____ angle.
L ∠AOE and _____ are supplementary angles.
M ∠COD and _____ are complementary angles.
N Two angles having the same measure are said to be _________.
O ∠COD and ∠AOE are congruent because they are _________ angles.
P The two rays that form an angle are called the _____ of the angle.

<table>
<thead>
<tr>
<th>DEGREE</th>
<th>ADJACENT</th>
<th>INTERIOR</th>
<th>90°</th>
<th>∠EOD</th>
<th>VERTICAL</th>
<th>ANGLE</th>
<th>OBTUSE</th>
<th>ACUTE</th>
<th>SIDES</th>
<th>RIGHT</th>
<th>CONGRUENT</th>
<th>SUPPLEMENTARY</th>
<th>∠BOC</th>
<th>VERTEX</th>
<th>COMPLEMENTARY</th>
</tr>
</thead>
</table>

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Cryptic Quiz

TO DECODE THE ANSWERS TO THESE TWO QUESTIONS:
Figure out the measure of the unknown angle in any exercise. Then find this measure in the code. Each time it appears, write the letter of that exercise above it. Keep working and you will decode both answers.

1. WHAT IS ROUND AND VERY DANGEROUS?

112° 62° 120° 40° 120° 53° 45° 76° 40° 120° 104° 40° 54° 35°

2. WHAT HAS FIFTY LEGS BUT CAN’T WALK?

65° 112° 54° 60° 112° 40° 35° 119° 127° 120° 74° 35° 43° 35°

S IF \( m_1 = 76° \), THEN \( m_3 = \)  
R IF \( m_1 = 76° \), THEN \( m_2 = \)  
A IF \( m_2 = 112° \), THEN \( m_4 = \)  
N IF \( m_3 = 61° \), THEN \( m_4 = \)  
O IF \( m_1 = 112° \), THEN \( m_2 = \)  
T IF \( m_1 = 112° \), THEN \( m_3 = \)  
L IF \( m_5 = 36° \), THEN \( m_6 = \)  
U IF \( m_6 = 45° \), THEN \( m_5 = \)  
D IF \( m_7 = 73° \) AND \( m_8 = 64° \), THEN \( m_9 = \)  
P IF \( m_8 = 57° \) AND \( m_9 = 49° \), THEN \( m_7 = \)  
H IF \( m_7 = 80° \) AND \( m_9 = 35° \), THEN \( m_8 = \)  
V IF \( m_10 = 28° \), THEN \( m_11 = \)  
E IF \( m_11 = 55° \), THEN \( m_10 = \)  
F IF \( m_10 = 30° \), THEN \( m_12 = \)  
I IF \( m_10 = 30° \), THEN \( m_13 = \)  
C IF \( m_13 = 130° \), THEN \( m_10 = \)
Daffynition Decoder

TO DECODE THESE THREE DAFFYNITIONS, FOLLOW THESE DIRECTIONS:
Figure out the measure of the unknown angle in any exercise. Then find this
measure in the code. Each time it appears, write the letter of that exercise above it.

KEEP WORKING AND YOU WILL DECODE THE THREE DE-FUN-ITIONS.

RAINCOAT:

<table>
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<tr>
<th>40°</th>
<th>80°</th>
<th>132°</th>
<th>35°</th>
<th>95°</th>
<th>90°</th>
<th>48°</th>
<th>66°</th>
<th>90°</th>
<th>36°</th>
<th>48°</th>
</tr>
</thead>
</table>

PASTEURIZE:

<table>
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<tr>
<th>40°</th>
<th>130°</th>
<th>130°</th>
<th>105°</th>
<th>36°</th>
<th>48°</th>
<th>40°</th>
<th>130°</th>
<th>30°</th>
<th>90°</th>
<th>90°</th>
</tr>
</thead>
</table>

WILL: ____________________________

| 36° | 95° | 90° | 36° | 95° | 55° | 33° | 50° | 90° | 36° | 66° | 36° | 31° |

1. IF \( \angle 1 = 48\)°, THEN \( \angle 3 = \) ___
2. IF \( \angle 1 = 48\)°, THEN \( \angle 4 = \) ___
3. IF \( \angle 6 = 40\)°, THEN \( \angle 5 = \) ___
4. IF \( \angle 7 = 54\)°, THEN \( \angle 8 = \) ___
5. IF \( \angle 7 = 59\)°, THEN \( \angle 6 = \) ___
6. IF \( \angle 5 = 57\)°, THEN \( \angle 8 = \) ___
7. IF \( \angle 3 = 50\)°, THEN \( \angle 9 = \) ___
8. IF \( \angle 12 = 120\)°, THEN \( \angle 3 = \) ___
9. IF \( \angle 7 = 55\)° AND \( \angle 9 = 45\)°, THEN \( \angle 15 = \) ___
10. IF \( \angle 3 = 46\)° AND \( \angle 14 = 99\)°, THEN \( \angle 8 = \) ___
11. IF \( \angle 9 = 29\)° AND \( \angle 15 = 85\)°, THEN \( \angle 7 = \) ___
12. IF \( \angle 8 = 37\)° AND \( \angle 3 = 38\)°, THEN \( \angle 14 = \) ___
13. IF \( \angle 7 = 40\)° AND \( \angle 15 = 90\)°, THEN \( \angle 12 = \) ___
14. IF \( \angle 3 = 35\)° AND \( \angle 16 = 90\)°, THEN \( \angle 8 = \) ___
15. IF \( \angle 8 = 40\)° AND \( \angle 12 = 140\)°, THEN \( \angle 15 = \) ___
16. IF \( \angle 7 = 55\)° AND \( \angle 1 = 50\)°, THEN \( \angle 16 = \) ___

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HOW DO BULLDOGS GET FLAT NOSES?

DIRECTIONS: Measure any angle below and find your answer in one of the boxes at the bottom. Write the vertex letter of the angle in the box. Keep working and you will discover the answer to the title question.

A I N
E R A
O R C
G F R
H P

118° 32° 136° 29° 104° 159° 63° 96° 17° 77° 82° 115° 24° 107° 93° 85° 164° 150° 90° 100° 139°
Why Did Orgo Iron His Four-leaf Clover?

Circle the letter of the phrase that best completes any statement below. Write this letter in each box at the bottom of the page that contains the statement number. (The exercises refer to the figure at the right, where \( m \parallel n \).)

**KEEP WORKING AND YOU WILL DISCOVER THE ANSWER TO THE TITLE QUESTION.**

<p>| | | | | | | | |</p>
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<thead>
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</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td>Two lines that intersect at right angles are (L) parallel (N) perpendicular</td>
<td></td>
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<tr>
<td><strong>2</strong></td>
<td>Two lines in the same plane that never intersect are (C) parallel (K) perpendicular</td>
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<tr>
<td><strong>3</strong></td>
<td>A line that intersects two or more lines at different points is a (E) transversal (A) bisector</td>
<td></td>
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<tr>
<td><strong>4</strong></td>
<td>In the figure, the angles labeled 1, 2, 7, and 8 are (B) interior angles (G) exterior angles</td>
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<tr>
<td><strong>5</strong></td>
<td>The angles labeled 3, 4, 5, and 6 are (A) interior angles (T) exterior angles</td>
<td></td>
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</tr>
<tr>
<td><strong>6</strong></td>
<td>Pairs of angles such as those labeled 1 and 5, or 4 and 8, are (I) corresponding angles (U) adjacent angles</td>
<td></td>
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<tr>
<td><strong>7</strong></td>
<td>The angles labeled 3 and 6 are (K) alternate interior angles (D) alternate exterior angles</td>
<td></td>
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<tr>
<td><strong>8</strong></td>
<td>The angles labeled 4 and 5 are (W) alternate interior angles (P) alternate exterior angles</td>
<td></td>
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<tr>
<td><strong>9</strong></td>
<td>If two parallel lines are cut by a transversal, then corresponding angles are (T) supplementary (R) congruent</td>
<td></td>
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<tr>
<td><strong>10</strong></td>
<td>If ( \angle 1 ) is 125°, then ( \angle 5 ) is (S) 60° (H) 125°</td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td><strong>11</strong></td>
<td>Alternate interior angles are (U) congruent (O) complementary</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>12</strong></td>
<td>If ( \angle 3 ) is 60°, then ( \angle 6 ) is (B) 40° (L) 60°</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>13</strong></td>
<td>If ( \angle 3 ) is 60°, then ( \angle 8 ) is (S) 120° (T) 60°</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>14</strong></td>
<td>When two lines in a plane are cut by a transversal, and if corresponding angles are congruent, then the two lines are (F) intersecting (P) parallel</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

| 10 | 3 | 8 | 5 | 13 | 14 | 9 | 13 | 13 | 6 | 1 | 4 | 10 | 6 | 13 | 12 | 11 | 2 | 7 |

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What is Unusual About The New Surgeon Doll?

Find the answer for any exercise below in the CODE KEY. Notice the letter next to it. Print this letter in the box at the bottom of the page that contains the exercise number. Keep working and you will discover the answer to the title question. (Assume that lines in each figure which do not intersect are parallel.)

In the first figure at the right, find:
1. \( \angle 3 = \)  
2. \( \angle 4 = \)  
3. \( \angle 2 = \)
4. \( \angle 5 = \)
5. \( \angle 6 = \)
6. \( \angle 1 = \)

In the second figure, find:
7. \( \angle 1 = \)  
8. \( \angle 6 = \)  
9. \( \angle 5 = \)  
10. \( \angle 7 = \)  
11. \( \angle 3 = \)  
12. \( \angle 2 = \)

In the third figure, find:
13. \( \angle 4 = \)  
14. \( \angle 3 = \)  
15. \( \angle 5 = \)  
16. \( \angle 2 = \)  
17. \( \angle 1 = \)

In the fourth figure, find:
18. \( \angle 2 = \)  
19. \( \angle 4 = \)  
20. \( \angle 1 = \)  
21. \( \angle 3 = \)

<table>
<thead>
<tr>
<th>CODE KEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>40° N</td>
</tr>
<tr>
<td>45° E</td>
</tr>
<tr>
<td>55° A</td>
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<td>65° O</td>
</tr>
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<td>70° S</td>
</tr>
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<td>85° B</td>
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<td>110° T</td>
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<tr>
<td>115° R</td>
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<tr>
<td>135° I</td>
</tr>
<tr>
<td>140° P</td>
</tr>
</tbody>
</table>

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Why do Arctic Explorers Wash Their Clothes In Tide?

TO ANSWER THIS QUESTION, FOLLOW THESE INSTRUCTIONS:
Under each figure, circle the letter of each word that correctly names the figure. Rearrange the circled letters under each figure to make a word. Write these words, in order, in the boxes at the bottom of the page.
Getting Into Shapes

Figure out the best word to complete any statement below and write it in the boxes next to the statement. One or more of the boxes has a number. This number tells you where to put that letter in the box at the bottom of the page. Keep working and you will spell out a message. Good luck!

1. A triangle is a ____ with three sides.
2. A polygon with four sides is a ____.
3. A polygon with five sides is a ____.
4. A hexagon is a polygon with six sides and six ____.
5. A polygon with eight sides is an ____.
6. A polygon with ten sides is a ____.
7. A triangle with no two congruent sides is a ____ triangle.
8. A triangle (or trapezoid) with two congruent sides is ____.
9. A polygon with all sides congruent is ____.
10. A triangle with a 90° angle is a ____ triangle.
11. A quadrilateral whose opposite sides are parallel is a ____.
12. A parallelogram with four right angles is a ____.
13. A quadrilateral with one pair of parallel sides is a ____.
14. A parallelogram which is equilateral is a ____.
15. A rectangle which is equilateral is a ____.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
What Can You Wear to a Costume Party?

Complete any statement below with one of the answers given at the bottom of the page. The write the letter of the statement above its correct answer. Keep working and you will discover the answer to the above question.

1. The set of points in a plane at a fixed distance from a given point is a _______.
2. The points on a circle are all the same distance from the _______.
3. A line segment from the center to any point on a circle is a _______.
4. A line segment with both endpoints on a circle, such as AB is a _______.
5. A chord that passes through the center of a circle is a _______.
6. The length of a radius is _______ the length of a diameter.
7. An angle whose vertex is at the center of a circle is a _______.
8. Part of a circle is an _______.
9. If \( m \angle DOF \) is \( 110^\circ \), then \( m \angle (DF) \) is _______.
10. If \( m \angle DOF \) is \( 110^\circ \), then \( m \angle (FBD) \) is _______.
11. If \( m \angle BOF \) is \( 150^\circ \), then \( m \angle (CE) \) is _______.
12. If \( m \angle BOF \) is \( 150^\circ \), then \( m \angle (EAC) \) is _______.
13. If \( m \angle BOF \) is \( 150^\circ \), then \( m \angle (BC) \) is _______.
14. If \( m \angle BOF \) is \( 150^\circ \), then \( m \angle (CEB) \) is _______.

M. An arc with a degree measure less than \( 180^\circ \) is a _______.
G. An arc with a degree measure more than \( 180^\circ \) is a _______.

<table>
<thead>
<tr>
<th>330°</th>
<th>half</th>
<th>250°</th>
<th>major arc</th>
<th>diameter</th>
<th>30°</th>
<th>radius</th>
<th>arc</th>
<th>circle</th>
<th>150°</th>
<th>chord</th>
<th>210°</th>
<th>110°</th>
<th>minor arc</th>
<th>center</th>
<th>central angle</th>
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</tbody>
</table>
How Can You Tell When There Are 1001 Pickles Under Your Bed?

Find the answer for any exercise below in the CODE KEY. Notice the letter next to it. Print this letter in the box at the bottom of the page that contains the exercise number. Keep working and you will discover the answer to the title question.

In the first figure, find the degree measure of:

1. \( \angle \text{DOE} \)  
2. \( \angle \text{AOE} \)  
3. \( \angle \text{COB} \)  
4. \( \overline{BC} \)  
5. \( \overline{DE} \)  
6. \( \overline{EAD} \)  
7. \( \overline{EA} \)  
8. \( \overline{ACE} \)  

In the second figure, find the degree measure of:

9. \( \angle \text{COA} \)  
10. \( \angle \text{COB} \)  
11. \( \overline{AB} \)  
12. \( \overline{BDA} \)  
13. \( \overline{EA} \)  
14. \( \overline{ABE} \)  
15. \( \overline{DE} \)  
16. \( \overline{CE} \)  

In the third figure, find the degree measure of:

17. \( \angle \text{BOA} \)  
18. \( \angle \text{DOA} \)  
19. \( \overline{DA} \)  
20. \( \overline{CD} \)  
21. \( \overline{DAC} \)  
22. \( \overline{ACD} \)  
23. \( \overline{BCA} \)  
24. \( \overline{BD} \)  

CODE KEY

\[
\begin{array}{c|c}
23^\circ & Y \\
35^\circ & R \\
67^\circ & A \\
80^\circ & E \\
90^\circ & O \\
100^\circ & L \\
145^\circ & T \\
180^\circ & I \\
215^\circ & G \\
260^\circ & C \\
270^\circ & U \\
280^\circ & S \\
293^\circ & H \\
325^\circ & N \\
\end{array}
\]
How Did The Baby Pigeon Manage To Fly South In The Winter?

TO ANSWER THE TITLE QUESTION:

Find a pair of CONGRUENT FIGURES below. One of them will have a number and the other will have a letter. The number tells you where to put the letter in the boxes at the bottom of the page.

KEEP WORKING AND YOU WILL DISCOVER THE PUNNY ANSWER.
Why Did Orgo Think His Pants Were Too Short?

Next to each pair of congruent triangles below are listed all the angles and sides of the two triangles. Find a pair of CORRESPONDING PARTS. One of the corresponding parts will have a number, and the other will have a letter. Write the letter in the box at the bottom of the page that contains the number of the corresponding part.

1. \( \angle A \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
2. \( \angle B \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
3. \( \angle C \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
4. \( \overline{AB} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
5. \( \overline{BC} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
6. \( \overline{CA} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
7. \( \angle G \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
8. \( \angle H \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
9. \( \angle I \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
10. \( \overline{GH} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
11. \( \overline{HI} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
12. \( \overline{IG} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
13. \( \angle M \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
14. \( \angle N \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
15. \( \angle O \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
16. \( \overline{MN} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
17. \( \overline{NO} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
18. \( \overline{OM} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
19. \( \angle S \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
20. \( \angle T \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
21. \( \angle TUS \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
22. \( \overline{ST} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
23. \( \overline{TU} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
24. \( \overline{US} \)  \( \bigtriangleup \) \( \angle \) \( \angle \) \( \angle \)
Triangle Treat

All the sides and angles are listed for each triangle. Find a pair of CORRESPONDING PARTS. One will have a number, and the other will have a letter. Write the letter in the box at the bottom of the page that contains the number of the corresponding part.

$\triangle ABD \cong \triangle CBD$
1. $\angle A$ \hspace{5mm} S \hspace{1mm} BD
2. $\angle ABD$ \hspace{5mm} 1 \hspace{1mm} CDB
3. $\angle BDA$ \hspace{5mm} E \hspace{1mm} C
4. AB \hspace{5mm} A \hspace{1mm} CD
5. BD \hspace{5mm} B \hspace{1mm} BC
6. AD \hspace{5mm} 0 \hspace{1mm} DBC

$\triangle EFG \cong \triangle HGF$
7. $\angle E$ \hspace{5mm} R \hspace{1mm} FH
8. $\angle EFG$ \hspace{5mm} 0 \hspace{1mm} H
9. $\angle FGE$ \hspace{5mm} E \hspace{1mm} FGH
10. EF \hspace{5mm} E \hspace{1mm} FG
11. FG \hspace{5mm} 1 \hspace{1mm} GFH
12. GE \hspace{5mm} S \hspace{1mm} GH

$\triangle EFI \cong \triangle HGI$
13. $\angle E$ \hspace{5mm} S \hspace{1mm} HGI
14. $\angle EFI$ \hspace{5mm} C \hspace{1mm} IH
15. $\angle FIE$ \hspace{5mm} J \hspace{1mm} GIH
16. FE \hspace{5mm} E \hspace{1mm} GH
17. FI \hspace{5mm} E \hspace{1mm} H
18. IE \hspace{5mm} R \hspace{1mm} GI

$\triangle JLM \cong \triangle NLK$
19. $\angle J$ \hspace{5mm} T \hspace{1mm} LKN
20. $\angle L$ \hspace{5mm} R \hspace{1mm} L
21. $\angle LMJ$ \hspace{5mm} T \hspace{1mm} KN
22. LJ \hspace{5mm} V \hspace{1mm} LN
23. LM \hspace{5mm} D \hspace{1mm} LK
24. MJ \hspace{5mm} E \hspace{1mm} N

$\triangle KJO \cong \triangle NMO$
25. $\angle J$ \hspace{5mm} C \hspace{1mm} ON
26. $\angle KJO$ \hspace{5mm} P \hspace{1mm} MO
27. $\angle KOJ$ \hspace{5mm} S \hspace{1mm} NMO
28. KJ \hspace{5mm} N \hspace{1mm} MON
29. KO \hspace{5mm} T \hspace{1mm} N
30. OJ \hspace{5mm} T \hspace{1mm} MN

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Why Did Mrs. Washington Go Into George's Bedroom Early in the Morning?

TO ANSWER THIS QUESTION FOLLOW THESE INSTRUCTIONS:

Two congruent triangles are indicated for each exercise. Assuming you know only that the marked parts are congruent, circle the theorem that proves the two triangles are congruent. Write the letter of the correct choice in each box at the bottom of the page that contains the exercise number.

1. \( \triangle ABC \cong \triangle DEF \)
   - \( \) SSS
   - \( \) SAS
   - \( \) ASA

2. \( \triangle BCD \cong \triangle FEG \)
   - \( \) SSS
   - \( \) SAS
   - \( \) ASA

3. \( \triangle CDE \cong \triangle FGE \)
   - \( \) SSS
   - \( \) SAS
   - \( \) ASA

4. \( \triangle DEF \cong \triangle HIG \)
   - \( \) SSS
   - \( \) SAS
   - \( \) ASA

5. \( \triangle EFG \cong \triangle EHG \)
   - \( \) SSS
   - \( \) SAS
   - \( \) ASA

6. \( \triangle FGI \cong \triangle HGI \)
   - \( \) SSS
   - \( \) SAS
   - \( \) ASA

7. \( \triangle GHJ \cong \triangle IJH \)
   - \( \) SSS
   - \( \) SAS
   - \( \) ASA

8. \( \triangle HJK \cong \triangle LJI \)
   - \( \) SSS
   - \( \) SAS
   - \( \) ASA
1. HOW CAN YOU STOP A MONSTER FROM BITING HIS NAILS?

12.5  10  3\frac{8}{9}  9  4.39  11  12.5  1.92  9  10  9\frac{1}{3}  3.91  4.39  8\frac{1}{4}  9  3.91

2. HOW CAN YOU TELL WHEN THERE IS A MONSTER IN BED WITH YOU?

2\frac{2}{3}  6  20  4.39  9  12.5  8\frac{1}{4}  35  4.39  11  3.91  5\frac{3}{5}  10  \frac{2}{3}  10  12.5  10  3.91

TO DECODE THE ANSWERS TO THE TWO QUESTIONS ABOVE:
Find the length of the side indicated in any exercise below. Each time this length appears in the code, write the letter of that exercise above it. Keep working and you will decode the two mystery answers.

\[ \triangle ABC \sim \triangle DEF. \] The letters \( a, b, c, d, e, \) and \( f \) represent the lengths of the sides.


\[ \triangle RST \sim \triangle XYZ. \] The letters \( r, s, t, x, y, \) and \( z \) represent the lengths of the sides.

A. Find \( e, \) if \( a = 8, d = 22, b = 4. \)
B. Find \( t, \) if \( s = 1\frac{1}{2}, y = 5, z = 8. \)
C. Find \( d, \) if \( b = 6, e = 15, a = 8. \)
D. Find \( y, \) if \( s = 42, r = 9, x = 2. \)
E. Find \( a, \) if \( f = 32, c = 12, d = 24. \)
F. Find \( r, \) if \( z = 5, x = 2\frac{1}{3}, t = 12. \)
G. Find \( c, \) if \( f = 15, b = 7, e = 3. \)
H. Find \( x, \) if \( s = 2, r = 2.3, y = 3.4. \)
I. Find \( f, \) if \( c = 2\frac{1}{2}, d = 24, a = 10. \)
J. Find \( z, \) if \( r = x, t = 4.39. \)
K. Find \( b, \) if \( c = 5, e = 7, f = 9. \)
L. Find \( s, \) if \( z = 3, y = 4.8, t = 1.2. \)
M. Find \( a, \) if \( b = 11, e = 8, d = 6. \)

A flagpole casts a shadow 25 meters long. If a woman who is 1.6 meters tall casts a shadow 4 meters long at the same time and location, the flagpole is ___ meters tall.

A building casts a shadow 37.5 meters long. If a meter stick casts a shadow 3 meters long at the same time and location, the building is ___ meters high.
What is the Title of This Picture?

TO DECODE THE TITLE OF THIS PICTURE:

Measure to the nearest millimeter the line segment named in any exercise below. Express the measurement in millimeters or centimeters, as indicated, and find it in the code. Each time it appears, write the letter of that exercise above it.

KEEP WORKING AND YOU WILL DECODE THE TITLE.

A  B  C  D  E  F  G  H  I  J

① = Length of \( \overline{AB} \) = \( \text{cm} \)  ④ = Length of \( \overline{EF} \) = \( \text{cm} \)  ⑦ = Length of \( \overline{HI} \) = \( \text{cm} \)
② = Length of \( \overline{DG} \) = \( \text{cm} \)  ⑤ = Length of \( \overline{CD} \) = \( \text{cm} \)  ⑧ = Length of \( \overline{EI} \) = \( \text{cm} \)
③ = Length of \( \overline{CI} \) = \( \text{cm} \)  ⑥ = Length of \( \overline{BG} \) = \( \text{cm} \)  ⑨ = Length of \( \overline{CF} \) = \( \text{cm} \)
⑩ = Length of \( \overline{AB} \) = \( \text{mm} \)  ⑪ = Length of \( \overline{BG} \) = \( \text{mm} \)  ⑫ = Length of \( \overline{CF} \) = \( \text{mm} \)
⑬ = Length of \( \overline{GJ} \) = \( \text{mm} \)  ⑭ = Length of \( \overline{AI} \) = \( \text{mm} \)  ⑮ = Length of \( \overline{DJ} \) = \( \text{mm} \)
⑭ = Length of \( \overline{AH} \) = \( \text{mm} \)  ⑰ = Length of \( \overline{HI} \) = \( \text{mm} \)  ⑱ = Length of \( \overline{BH} \) = \( \text{mm} \)
## Did You Hear About . . .

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<td>J</td>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
<td>O</td>
<td>P</td>
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</tbody>
</table>

**Directions:**
Write the appropriate number in the blank in any exercise below. Find this number in one of the answer columns and notice the word next to it. Write this word in the box that has the same letter as that exercise.

*KEEP WORKING AND YOU WILL HEAR ABOUT SOMETHING CINEMATIC!*

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<th>C</th>
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<th>E</th>
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<th>G</th>
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<td>2.5 m = ________ cm</td>
<td>0.0028 km = ________ cm</td>
<td>25—DOOR</td>
<td>0.01—DOING</td>
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<td></td>
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<tr>
<td>2.5 m = ________ mm</td>
<td>0.0028 km = ________ mm</td>
<td>2500—HORSE</td>
<td>43.2—WANTED</td>
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<td></td>
<td></td>
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<tr>
<td>890 m = ________ km</td>
<td>90 cm = ________ mm</td>
<td>200—BECAME</td>
<td>78,000—TRUCK</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4320 cm = ________ m</td>
<td>0.2 mm = ________ cm</td>
<td>900—BUT</td>
<td>8.9—HEAD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4320 cm = ________ mm</td>
<td>1000 mm = ________ km</td>
<td>6.49—A</td>
<td>250—THE</td>
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<tr>
<td>70.7 km = ________ m</td>
<td>1000 cm = ________ km</td>
<td>0.001—UP</td>
<td>280—MOVIE</td>
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<td>64.9 mm = ________ cm</td>
<td>7800 m = ________ km</td>
<td>780—A</td>
<td>6490—BETTER</td>
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<td>64.9 mm = ________ m</td>
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<td>0.0649—BIG</td>
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The Meter is Neater

Express each measurement in meters. Find your answers in the rectangle below. Cross out each box containing a correct answer. When you finish, there will be 9 boxes not crossed out. Print the letters from these boxes in the boxes at the bottom of the page. A hidden message will appear.

1. 57.5 cm = ______ m
2. 5.75 km = ______ m
3. 4700 dm = ______ m
4. 933 hm = ______ m
5. 80,000 mm = ______ m
6. 399.1 dam = ______ m
7. 0.69 km = ______ m
8. 0.008 hm = ______ m
9. 20.05 mm = ______ m
10. 690 cm = ______ m
11. 0.47 dam = ______ m
12. 70.2 dm = ______ m
13. 9.33 mm = ______ m
14. 20,050 dam = ______ m
15. 0.02 km = ______ m
16. 4366.6 hm = ______ m
17. 0.5 dm = ______ m
18. 200,000 cm = ______ m

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<th>PAR</th>
<th>ADE</th>
<th>TSO</th>
<th>REA</th>
<th>DWR</th>
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<td>200,500</td>
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</table>

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What is White And Goes Up?

To answer this question:
Fill in the blank in any exercise below. Draw a straight line connecting each exercise with its correct answer. Each line will cross a number and a letter. The number tells you where to put the letter in the row of boxes at the bottom of the page.

85 cm = _____ m • 8500
0.85 km = _____ m • 4.9
8.5 cm = _____ mm • 2770
85,000 dm = _____ m • 8.5
0.85 dam = _____ m • 0.0277
850 km = _____ dam • 49
4900 m = _____ hm • 27.7
49 mm = _____ dam • 0.85
4.9 hm = _____ km • 0.49
49 dam = _____ cm • 0.277
49,000 dm = _____ km • 850
49 m = _____ dm • 85,000
2.77 hm = _____ m • 2.77
2770 mm = _____ dm • 490
2.77 m = _____ dam • 85
0.0277 km = _____ cm • 0.0049
27.7 dam = _____ hm • 49,000
0.277 cm = _____ dm • 277
DIRECTIONS:
Figure out the PERIMETER of any polygon described below. Then find your answer in the code at the bottom of the page. Each time the answer appears in the code, write the letter of that problem above it.
KEEP WORKING AND YOU WILL DECODE THE LINE.

A Triangle with sides measuring 6.3 m, 2.9 m, and 10.5 m
T Rectangle with sides measuring 9.6 m and 3.8 m
I Square with side measuring 4.65 m
J Equilateral triangle with side measuring 15.8 m
O Pentagon with sides measuring 6.0 m, 7.5 m, 14.2 m, 9.1 m, and 0.9 m
U Parallelogram with sides measuring 5.32 m and 8.05 m
E Equilateral octagon with side measuring 4.325 m
D Isosceles triangle with base measuring 12.6 m and legs measuring 7.5 m
C Quadrilateral with sides measuring 9.4 m, 8.0 m, 15.0 m, and 6.8 m
S Rhombus with side measuring 17.005 m
H Equilateral decagon with side measuring 13.597 m
Y Isosceles trapezoid with bases measuring 2.1 m and 0.6 m, and legs measuring 3.8 m
N Hexagon with sides measuring 0.2 m, 3.7 m, 5.1 m, 4.0 m, 3.0 m, and 0.7 m
R Rectangle with sides measuring 17.4 m and 8.0 m
G Equilateral pentagon with side measuring 10.06 m

TITLE: HOLE OF FAME
26.8 m 135.97 m 34.6 m 50.3 m 50.8 m 19.7 m 16.7 m 27.6 m
39.2 m 19.7 m 16.7 m 10.3 m 37.7 m 16.7 m 18.6 m 68.02 m
47.4 m 26.74 m 68.02 m 26.8 m
50.3 m 37.7 m 50.8 m 50.3 m 34.6 m 68.02 m
What Do They Call the Golden Gate Bridge At 5 P.M.?

Compute the distance $x$ for any figure below and find your answer in the answer column. Notice the letter next to it. Write this letter in each box at the bottom of the page that contains the number of that figure. (Assume that all angles that appear to be right angles are right angles.)

1. $16$
   $x$
   $28$
2. $4.4$
   $8.7$
3. $9.8$
   $17.5$
4. $6$
   $2.75$
5. $8.2$
   $13.6$
6. $10.6$
   $15$
7. $2\frac{1}{4}$
   $10$
   $3\frac{1}{2}$
8. $0.7$
   $0.8$
   $0.9$
9. $2.7$
   $8.3$
10. $7\frac{3}{10}$
   $12\frac{1}{2}$
11. $7.6$
   $10.3$
12. $8\frac{1}{3}$
   $9\frac{1}{2}$

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Measuring Around

Figure out the PERIMETER of each polygon and find your answers in the rectangle. Cross out each box containing a correct answer. When you finish, there will be 7 boxes not crossed out. Print the letters from these boxes in the boxes at the bottom of the page.

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<td>23.4 mm</td>
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<td><strong>p = ___ mm</strong></td>
<td><strong>p = ___ cm</strong></td>
<td><strong>p = ___ m</strong></td>
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<td>1.125 m</td>
<td>29 mm</td>
<td>1.25 m</td>
</tr>
<tr>
<td><strong>p = ___ m</strong></td>
<td><strong>p = ___ mm</strong></td>
<td><strong>p = ___ m</strong></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>SKI</th>
<th>TEA</th>
<th>MAG</th>
<th>NET</th>
<th>WIN</th>
<th>ICI</th>
<th>GAR</th>
<th>STR</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>4.61</td>
<td>4.31</td>
<td>3.29</td>
<td>12.64</td>
<td>35.7</td>
<td>7.4</td>
<td>91.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ICK</th>
<th>ISS</th>
<th>YBU</th>
<th>CKA</th>
<th>SIN</th>
<th>GLE</th>
<th>SSM</th>
<th>ESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>295</td>
<td>306</td>
<td>8.1</td>
<td>93.6</td>
<td>3.16</td>
<td>34.9</td>
<td>286</td>
<td>51</td>
</tr>
</tbody>
</table>
Find the CIRCUMFERENCE of each circle with diameter (d) or radius (r) as indicated (use $\pi \approx 3.14$). Draw a straight line connecting each exercise with its correct answer. Each line will cross a number and a letter. The number tells you where to put the letter in the row of boxes at the bottom of the page.

- $d = 1$ cm
- $r = 1$ cm
- $d = 7$ cm
- $r = 9$ cm
- $d = 10$ cm
- $r = 50$ cm
- $d = 2.3$ cm
- $r = 4.1$ cm
- $d = 0.75$ cm
- $r = 9.5$ m
- $d = 0.08$ m
- $r = 5000$ m
- $d = 22.2$ m
- $r = 0.625$ m
- $d = 70$ m
- $r = 350$ m
- $d = 7000$ m
- $r = 0.5$ m

CIRCUMFERENCE:
- $d = 1$ cm: 21.98 cm
- $r = 1$ cm: 31.4 cm
- $d = 7$ cm: 3.925 m
- $r = 9$ cm: 2198 m
- $d = 10$ cm: 2.355 cm
- $r = 50$ cm: 314 cm
- $d = 2.3$ cm: 3.14 m
- $r = 4.1$ cm: 3.14 cm
- $d = 0.75$ cm: 59.66 m
- $r = 9.5$ m: 31400 m
- $d = 0.08$ m: 6.28 cm
- $r = 5000$ m: 69708 m
- $d = 22.2$ m: 219.8 m
- $r = 0.625$ m: 56.52 cm
- $d = 70$ m: 7.222 cm
- $r = 350$ m: 21,980 m
- $d = 7000$ m: 25748 cm
- $r = 0.5$ m: 0.2512 m

PRE-ALGEBRA WITH PIZZAZZ!
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Figure out the PERIMETER of each figure and find your answers in the rectangle below. Cross out each box containing a correct answer. When you finish, there will be 3 boxes not crossed out. Print the letters from these boxes in the boxes at the bottom of the page. (All curves shown are semicircles; use $\pi \approx 3.14$)

THE NAME OF A FAMOUS HONOLULU TYPING SCHOOL WILL APPEAR!
Why are Square drinking glasses better than Round ones?

Count the number of SIGNIFICANT DIGITS in any measurement below. In some cases, the number cannot be determined. Write your answer in the blank. Then find the answer at the bottom of the page and write the letter of that exercise in ANY ONE of the boxes under it.

When you finish, rearrange the letters in each group to make a word. Write the words from each group in the BOTTOM row of boxes. You will have the answer to the title question!

E 645 cm
L 8300 kg
Y 0.75 km
S 2.807 mm
H 0.02 sec
A 6.25 × 10^3 l
N 807.009 mm

E 54,000 m
H 5.4 × 10^4 m
I 5.400 × 10^4 m
O 5.4000 × 10^4 m

T 45.001 × 10^-3 g
A 880 ml
G 880.8 dm
E 0.00625 kl

T 0.090 mm
T 98,000,000 m
R 9.800 × 10^7 m
L 106 km/sec

D 4.9700 × 10^-4 g
B 500 sec
N 0.3000 km

PRE-ALGEBRA WITH PIZZAZZ!
© Creative Publications
What is a GOLFER'S Favorite Number?

Find the GREATEST POSSIBLE ERROR for any measurement below. Circle the correct answer. Then connect the points given for that answer.

WHEN YOU FINISH, YOU WILL KNOW A GOLFER'S FAVORITE NUMBER!

CONNECT: 5.2 m < 0.5 m < K→L→X  
0.05 m < G→H→U  

CONNECT: 4.7 × 10^3 cm < 0.5 cm < F→E→R  
50 cm < M→Z

9.13 cm < 0.005 cm < P→Q→DD  
0.0005 cm < O→N  

6.2 × 10^6 km < 5000 km < GG→G  
< CC→DD

67.07 mm < 0.05 mm < F→S→E  
0.005 mm < L→K→KK

7.34 × 10^{-2} m < 0.00005 m < U→T→G  
0.0005 m < DD→D→E

24 km < 5 km < X→Y→K  
0.5 km < J→W

1.8 × 10^{-5} m < 0.00005 m < JJ→I  
0.0000005 m < I→II

8.8 kg < 0.005 kg < CC→D→C  
0.05 kg < BB→AA

2.002 × 10^8 l < 500,000 l < A→N  
50,000 l < C→D→DD

150.7 cm < 0.05 cm < KK→LL  
0.5 cm < Z→M→L

9.062 × 10^{-3} g < 0.000005 g < A→B→BB  
0.0000005 g < EE→E→F

0.065 m < 0.0005 m < BB→O→N  
0.005 m < U→T→H

8.0 × 10^2 kg < 5 kg < II→JJ  
< Y→X→L

0.80 sec < 0.005 sec < F→S  
0.5 sec < M→L→Y

8 × 10^2 kg < 5 kg < AA→A→B  
< X→W→KK

72.203 g < 0.00005 g < I→V  
0.0005 g < L→Y

8.00 × 10^2 kg < 5 kg < J→K→W  
0.5 kg < Y→X→KK

PRE-ALGEBRA WITH PIZZAZZ!
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Why Did the Chef Throw Vegetables in the Air?

Use a calculator for each computation. Round each answer to the decimal place indicated. Find your answer in the answer columns and notice the letter next to it. Write this letter in each box at the bottom of the page that contains the exercise number.

| 1  | 6.47 cm ÷ 3 =                |                | B  | 1.62 mm          | A  | 180.0000 km     |
| 2  | 1.975 m × 3.5 m =            |                | R  | 1.95             | F  | 389.9 cm²       |
| 3  | 9.27 km ÷ 1.15 km =          |                | I  | 8.06             | G  | 62.7778 cm      |
| 4  | 6.71 m ÷ 15.3 sec =          |                | D  | 180.00 km        | J  | 62.778 cm       |
| 5  | 37.6667 cm ÷ 0.6 =           |                | L  | 0.0610           | N  | 15.91 km/h      |
| 6  | 13.43 mm × 9.751 mm =         |                | V  | 6.8 m²           | A  | 0.0140 km/sec   |
| 7  | 4.0075 km × 5 =              |                | Y  | 20.037 km        | D  | 131.0 mm²       |
| 8  | 68.80 km ÷ 4.325 h =         |                | T  | 2.16 cm          | L  | 15.9 km/h       |
| 9  | 0.0481 m ÷ 0.789 m =         |                | F  | 2.15 cm          | U  | 0.438 m/sec     |
| 10 | 17.37 cm ÷ 22.45 cm =        |                | S  | 2.0              | M  | 0.439 m/sec     |
| 11 | 485.5 mm ÷ 300 =             |                | E  | 6.9 m²           | K  | 390.0 cm²       |
| 12 | 12.857 km × 14 =             |                | B  | 0.0610000        | R  | 130.9 mm²       |
| 13 | 0.839 km ÷ 60.0 sec =         |                | H  | 1.618 mm         | P  | 0.013 km/sec    |
| 14 | 12,500 mm ÷ 6400 mm =        |                | C  | 8.1              | W  | 20.038 km       |

11 2 7 13 14 4 13 10 3 8 5 13 1 12 14 14 2 6 14 13 9 13 6
A Square Deal

DIRECTIONS: Figure out the AREA of any letter below and find your answer in the code at the bottom of the page. Each time the answer appears in the code, write the letter above it.

KEEP WORKING AND YOU WILL DECODE THE MESSAGE.

TITLE: SNOOZE NEWS

29-22\frac{1}{2}-30-30-34-22-29-25-39-30-41\frac{1}{2}-30-29-25-40-25\frac{1}{2}-26-40-38-41\frac{1}{2}-22\frac{1}{2}-22-25\frac{1}{2}-30
What is GREEN and makes HOLES?

Find the AREA of each figure below and circle your answers in the answer column. When you finish, arrange the letters in order from the letter of the smallest correct answer to the letter of the largest correct answer. Write the letters in this order in the boxes at the bottom of the page. (In the first four problems, assume each box = 1 cm².)

1. [Grid]
2. [Grid]
3. [Grid]
4. [Grid]

5. [Square]

6. [Triangle]
7. [Triangle]
8. [Triangle]
9. [Shape]
10. [Shape]
11. [Shape]
12. [Shape]

| K | 49.95 cm² |
| R | 28 cm² |
| E | 82.31 cm² |
| L | 35 cm² |
| T | 29.83 cm² |
| I | 46.02 cm² |
| S | 55.54 cm² |
| A | 24 cm² |
| P | 39.48 cm² |
| L | 66.7 cm² |
| R | 42 cm² |
| I | 30 cm² |
| C | 47.35 cm² |
| N | 75.41 cm² |
| D | 27.04 cm² |
| G | 22.4 cm² |
| L | 38.71 cm² |

LETTER OF SMALLEST CORRECT ANSWER

LETTER OF LARGEST CORRECT ANSWER
What happened when Orgo tore up a PUZZLE Book?

Work each problem below and circle the letter of the correct answer. Write the letter of the correct choice in each box at the bottom of the page that contains the problem number.

In the first six problems, find the area of the figure.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (I)</td>
<td>101.25 cm²</td>
<td>(E) 99.75 cm²</td>
</tr>
<tr>
<td>2. (V)</td>
<td>2162 m²</td>
<td>(T) 2072 m²</td>
</tr>
<tr>
<td>3. (H)</td>
<td>21.52 km²</td>
<td>(S) 23.84 km²</td>
</tr>
<tr>
<td>4. (W)</td>
<td>926 mm²</td>
<td>(B) 874 mm²</td>
</tr>
<tr>
<td>5. (N)</td>
<td>1.73 km²</td>
<td>(A) 1.69 km²</td>
</tr>
<tr>
<td>6. (R)</td>
<td>45.7 m²</td>
<td>(C) 50.34 m²</td>
</tr>
</tbody>
</table>

7. A rectangular room is 4.8 meters wide and 6.5 meters long. What would it cost to carpet this room if carpeting costs $17 per square meter?
   - (O) $526.60
   - (E) $530.40

8. What is the height of a parallelogram with a base measuring 9.4 meters and an area of 126.9 square meters?
   - (N) 14.3 m
   - (D) 13.5 m

9. What is the base of a parallelogram with a height of 0.75 kilometers and an area of 1.38 square kilometers?
   - (M) 1.84 km
   - (L) 1.73 km

A rectangular wall is 6.0 meters long and 2.5 meters high. It has a rectangular window that is 1.2 meters wide and 1.75 meters high.

10. What is the area of the window?
    - (O) 2.1 m²
    - (U) 2.25 m²

11. What is the area of the wall (not including the window)?
    - (R) 12.9 m²
    - (N) 13.4 m²

12. How many liters of paint are needed to paint the wall if one liter covers 10 square meters?
    - (P) 134 l
    - (S) 1.29 l
Crack The Code

Figure out the AREA of any triangle below and find your answer in the code. Each time it appears in the code, write the letter of that triangle above it. Keep working and you will crack the code.

<table>
<thead>
<tr>
<th>T</th>
<th>O</th>
<th>Y</th>
<th>A</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>I</td>
<td>N</td>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td>B</td>
<td>C</td>
<td>L</td>
<td>H</td>
<td>P</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Triangle</th>
<th>Base</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>4.5</td>
<td>9.3</td>
</tr>
<tr>
<td>O</td>
<td>6.4</td>
<td>8.5</td>
</tr>
<tr>
<td>Y</td>
<td>1.1</td>
<td>1.5</td>
</tr>
<tr>
<td>A</td>
<td>12.8</td>
<td>5.7</td>
</tr>
<tr>
<td>G</td>
<td>17</td>
<td>1.5</td>
</tr>
<tr>
<td>E</td>
<td>0.53</td>
<td>1.5</td>
</tr>
<tr>
<td>I</td>
<td>2.7</td>
<td>3.6</td>
</tr>
<tr>
<td>N</td>
<td>0.88</td>
<td>0.25</td>
</tr>
<tr>
<td>D</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Triangle</th>
<th>Base</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>4.5</td>
<td>9.3</td>
</tr>
<tr>
<td>C</td>
<td>6.4</td>
<td>8.5</td>
</tr>
<tr>
<td>L</td>
<td>15.5</td>
<td>120</td>
</tr>
<tr>
<td>H</td>
<td>17</td>
<td>1.5</td>
</tr>
<tr>
<td>P</td>
<td>0.875</td>
<td>2.0</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Title: Wheeler Dealers</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.5 20.925 4.86 0.2915 18 0.2915 155 27.2 36.48 1.125 16 0.875</td>
</tr>
<tr>
<td>1.125 17.5 36.48 15 1.125 4.86 0.11 24.5 36.48 15 16 0.875 27.2 161.5 17.5 155</td>
</tr>
</tbody>
</table>
What are the two favorite letters of children?

THE ANSWER TO THE TITLE QUESTION IS HIDDEN IN THE RECTANGLE. TO FIND IT:

Figure out the AREA and the PERIMETER of each triangle below. Find your answers in the rectangle. Shade in each area containing a correct answer.
Did you hear about...  

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>I</td>
<td>J</td>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
</tr>
<tr>
<td>O</td>
<td>P</td>
<td>Q</td>
<td>R</td>
<td>S</td>
<td>T</td>
<td>U</td>
</tr>
</tbody>
</table>

DIRECTIONS: Figure out the AREA of a circle with radius \( r \) or diameter \( d \) as indicated (use \( \pi \approx 3.14 \)). Find your answer in one of the answer columns and notice the word next to it. Write this word in the box that contains the same letter as that exercise.

KEEP WORKING AND YOU WILL HEAR ABOUT SOMEBODY WHO RODE A ROUND.

<table>
<thead>
<tr>
<th>Area</th>
<th>Letter</th>
<th>( r )</th>
<th>( d )</th>
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</thead>
<tbody>
<tr>
<td>0.000314 m²</td>
<td>A</td>
<td>3 cm</td>
<td></td>
</tr>
<tr>
<td>0.00314 m²</td>
<td>B</td>
<td>2 cm</td>
<td></td>
</tr>
<tr>
<td>11.44 cm²</td>
<td>C</td>
<td>20 cm</td>
<td></td>
</tr>
<tr>
<td>28.26 cm²</td>
<td>D</td>
<td>8 cm</td>
<td></td>
</tr>
<tr>
<td>50.24 cm²</td>
<td>E</td>
<td>12 cm</td>
<td></td>
</tr>
<tr>
<td>38.465 cm²</td>
<td>F</td>
<td>5 m</td>
<td></td>
</tr>
<tr>
<td>51.74 cm²</td>
<td>G</td>
<td>0.1 m</td>
<td></td>
</tr>
<tr>
<td>12.56 m²</td>
<td>H</td>
<td>30 cm</td>
<td></td>
</tr>
<tr>
<td>0.19625 m²</td>
<td>I</td>
<td>3.5 cm</td>
<td></td>
</tr>
<tr>
<td>38.465 m²</td>
<td>J</td>
<td>7 m</td>
<td></td>
</tr>
<tr>
<td>0.0314 m²</td>
<td>K</td>
<td>5 cm</td>
<td></td>
</tr>
<tr>
<td>0.0314 m²</td>
<td>L</td>
<td>6.2 m</td>
<td></td>
</tr>
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<td>M</td>
<td>0.01 m</td>
<td></td>
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<td>N</td>
<td>3 cm</td>
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</tr>
<tr>
<td>50.24 cm²</td>
<td>O</td>
<td>0.9 m</td>
<td></td>
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<td>3.14 m²</td>
<td>P</td>
<td>200 m</td>
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<td>7.245 cm²</td>
<td>Q</td>
<td>0.25 m</td>
<td></td>
</tr>
<tr>
<td>0.000314 m²</td>
<td>R</td>
<td>50 cm</td>
<td></td>
</tr>
<tr>
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<td>S</td>
<td>3.2 m</td>
<td></td>
</tr>
<tr>
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<td>T</td>
<td>2 m</td>
<td></td>
</tr>
<tr>
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<td>U</td>
<td>1 cm</td>
<td></td>
</tr>
<tr>
<td>50.24 cm²</td>
<td>V</td>
<td>27.56 m²</td>
<td></td>
</tr>
<tr>
<td>38.465 cm²</td>
<td>W</td>
<td>5 m</td>
<td></td>
</tr>
<tr>
<td>3.14 cm²</td>
<td>X</td>
<td>3.14 cm²</td>
<td></td>
</tr>
<tr>
<td>12.56 m²</td>
<td>Y</td>
<td>1 cm</td>
<td></td>
</tr>
<tr>
<td>0.19625 m²</td>
<td>Z</td>
<td>27.56 m²</td>
<td></td>
</tr>
</tbody>
</table>
THERE IS ONE KIND OF PERSON WHO LOVES PLANE GEOMETRY. TO FIND OUT WHO:

Solve each problem (use \( \pi = 3.14 \)) and find your answers at the bottom of the page. Shade in the letter above each correct answer. When you finish, you will know who loves plane geometry!

1. A: What is the area of the inscribed circle?
   B: What is the area of the shaded region?
   C: What is the circumference of the inscribed circle?

2. A: What is the area of the large circle?
   B: What is the area of the shaded region?
   C: What is the distance from A to B along the S-shaped curve?
   D: What is the circumference of the large circle?

3. If a circle has a circumference of 8.4 cm, what is the diameter of the circle to the nearest 0.1 cm?

4. A: What is the circumference of each small circle?
   B: What is the area of each small circle?
   C: What is the area of the shaded region?

5. If a circle has a circumference of 14.5 cm, what is the radius of the circle to the nearest 0.1 cm?

6. A: What is the distance around this track?
   B: What is the area of the shaded region?
   C: What is the area of the complete region inside the track?
What Problem Does A Five-Foot Man Have?

TO ANSWER THIS QUESTION: Figure out the volume of any rectangular solid below and find your answer in the code. Each time it appears in the code, write the letter of that exercise above it. Keep working and you will discover the answer to the question.

<table>
<thead>
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<th>Exercise</th>
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</tr>
<tr>
<td>E</td>
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<td>25</td>
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<tr>
<td>B</td>
<td>15</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>F</td>
<td>16</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>T</td>
<td>14</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>W</td>
<td>12</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>A</td>
<td>14</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>P</td>
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CODED ANSWER

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<th>720</th>
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<th>60</th>
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<th>60</th>
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<tbody>
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<td>630</td>
<td>56</td>
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<td>64</td>
<td>75</td>
<td>340</td>
<td>2640</td>
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<td>27</td>
<td>340</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How does an ESP expert send his mail?

Do any exercise below. Find your answer in the answer column and notice the letter next to it. Write this letter in each box that contains the number of that exercise.

In the first six exercises, find the volume of the figure. All dimensions are in centimeters.

1.  
   | 8.2 |
   | 10  |
   | 4.4 |

2.  
   | 9.1 |
   | 5.9 |
   | 5   |

3.  
   | 10.5|
   | 7.5 |
   | 13.6|

4.  
   | 0.75|
   | 2.5 |
   | 0.8 |

5.  
   | 4.7 |
   | 4   |
   | 4.5 |

6.  
   | 7.8 |
   | 3.5 |
   | 11.8|

7. What is the volume of a cube whose side measures 18 mm?

8. How many cubic meters of earth are needed to fill a hole in the shape of a rectangular solid with dimensions of 23 meters, 38 meters, and 4.5 meters?

9. A swimming pool is 20 meters long and 12 meters wide. What volume of water does the pool hold if the average depth of water is 1.75 meters?

A concrete patio is 5 meters long, 3.5 meters wide, and 8 centimeters thick.

10. How many cubic meters of concrete were needed to build the patio?

11. Concrete has a mass of about 2400 kilograms per cubic meter. About how many kilograms of concrete were needed to build the patio?
What Do You Call It
When A Bull Eats A Bomb?

Figure out the VOLUME of each prism and find your answers in the rectangle below. Cross out each box containing a correct answer. When you finish, there will be 5 boxes not crossed out. Print the letters from these boxes in the boxes at the bottom of the page.
What Should You Call A Man With A Clamp?

TO ANSWER THIS QUESTION: Find the VOLUME of each prism or pyramid and circle your answers in the answer list. When you finish, arrange the letters in order from the letter of the smallest correct answer to the letter of the largest correct answer. Write the letters in this order in the boxes at the bottom of the page.

1. \[ \text{Volume} = 6 \times 6 \times 6 = 216 \text{ cm}^3 \]

2. \[ \text{Volume} = \frac{1}{3} \times 6 \times 6 \times 6 = 72 \text{ cm}^3 \]

3. \[ \text{Volume} = \frac{1}{3} \times 4 \times 4 \times 4 = 16 \text{ cm}^3 \]

4. \[ \text{Volume} = \frac{1}{3} \times 4 \times 4 \times 4 = 16 \text{ cm}^3 \]

5. \[ \text{Volume} = \frac{1}{3} \times 12 \times 12 \times 15 = 1440 \text{ cm}^3 \]

6. \[ \text{Volume} = \frac{1}{3} \times 7.5 \times 3 \times 8 = 75 \text{ cm}^3 \]

7. \[ \text{Volume} = \frac{1}{3} \times 1 \times 0.9 \times 1.2 = 0.36 \text{ cm}^3 \]

8. \[ \text{Volume} = \frac{1}{3} \times 8.5 \times 60 = 170 \text{ cm}^3 \]

Answer List:

- R 810 cm$^3$
- S 30.6 cm$^3$
- G 144 cm$^3$
- N 3.38 cm$^3$
- A 0.18 cm$^3$
- Y 720 cm$^3$
- E 48 cm$^3$
- T 700 cm$^3$
- H 160 cm$^3$
- V 10.2 cm$^3$
- I 30 cm$^3$
- M 0.15 cm$^3$
- U 170 cm$^3$
- T 38 cm$^3$

LETTER OF SMALLEST CORRECT ANSWER

LETTER OF LARGEST CORRECT ANSWER
Solid Fun

Given under each figure are the formulas for its volume \( V \) and surface area \( S \). Use the appropriate formula to do any exercise below (use \( \pi \approx 3.14 \)). Circle the letter of the correct answer. Write this letter in each box at the bottom of the page that contains the number of that exercise.

\[
\begin{align*}
V & = \pi r^2 h \\
S & = 2\pi r(r+h)
\end{align*}
\]

\[
\begin{align*}
V & = \frac{1}{3} \pi r^2 h \\
S & = \pi r(r+s)
\end{align*}
\]

\[
\begin{align*}
V & = \frac{4}{3} \pi r^3 \\
S & = 4\pi r^2
\end{align*}
\]

1. Find the volume of a cylinder if \( r = 4 \text{ cm}, \ h = 10 \text{ cm} \).
   (R) 502.4 cm\(^3\)   (S) 516.4 cm\(^3\)

2. Find the surface area of a cylinder if \( r = 4 \text{ cm}, \ h = 10 \text{ cm} \).
   (I) 351.68 cm\(^2\)   (A) 349.58 cm\(^2\)

3. Find the volume of a cone if \( r = 8 \text{ cm}, \ h = 8 \text{ cm} \).
   (T) 310.54 cm\(^3\)   (E) 301.44 cm\(^3\)

4. Find the surface area of a cone if \( r = 8 \text{ cm}, \ h = 8 \text{ cm}, \ s = 10 \text{ cm} \).
   (S) 301.44 cm\(^2\)   (D) 290.44 cm\(^2\)

5. Find the volume of a sphere if \( r = 6 \text{ mm} \).
   (H) 904.32 mm\(^3\)   (L) 912.42 mm\(^3\)

6. Find the surface area of a sphere if \( r = 6 \text{ mm} \).
   (P) 412.26 mm\(^2\)   (F) 452.16 mm\(^2\)

7. Find the volume of a cylinder if \( r = 1.5 \text{ m}, \ h = 4 \text{ m} \).
   (T) 29.16 m\(^3\)   (N) 28.26 m\(^3\)

8. Find the surface area of a cylinder if \( r = 1.5 \text{ m}, \ h = 4 \text{ m} \).
   (G) 50.21 m\(^2\)   (B) 51.81 m\(^2\)

9. Find the volume of a cone if \( r = 0.5 \text{ dm}, \ h = 1.2 \text{ dm} \).
   (P) 0.415 dm\(^3\)   (M) 0.314 dm\(^3\)

10. Find the surface area of a cone if \( r = 0.5 \text{ dm}, \ h = 1.2 \text{ dm}, \ s = 1.3 \text{ dm} \).
    (K) 2.826 dm\(^2\)   (D) 2.906 dm\(^2\)

11. Find the volume of a sphere that has a diameter of 40 km.
    (W) 30,463\(\frac{1}{3}\) km\(^3\)   (C) 33,493\(\frac{1}{3}\) km\(^3\)

12. Find the surface area of a sphere that has a diameter of 40 km.
    (O) 5024 km\(^2\)   (A) 5048 km\(^2\)

\[
\begin{array}{cccccccccccccccc}
11 & 5 & 2 & 11 & 10 & 3 & 7 & 4 & 11 & 12 & 9 & 3 & 6 & 1 & 12 & 9 & 8 & 1 & 12 & 10 & 3 & 7 & 5 & 12 & 9 & 3 & 4
\end{array}
\]
Double Cross

1. What do you get when you cross A PORCUPINE WITH A GOAT?

\[
\begin{array}{ccccccccc}
80 & 225 & -8 & 23 & 12 & 30 & 23 & 2 & 30 & -7 & 5
\end{array}
\]

2. What do you get when you cross A SHARK WITH THE LOCH NESS MONSTER?

\[
\begin{array}{ccccccccc}
40 & 8 & 12 & 9 & -120 & 80 & 3
\end{array}
\]

3. What do you get when you cross A MATHEMATICIAN WITH A RUBBER BAND?

\[
\begin{array}{ccccccccc}
225 & 15 & 80 & 2 & 2 & 7 & 80 & 15 & 225 & 3 & -6 & 6 & 225
\end{array}
\]

4. What do you get when you cross A BLACKBIRD WITH A MAD DOG?

\[
\begin{array}{ccccccccc}
80 & 6 & 80 & 10 & -6 & 15 & -90 & 80 & 15 & -7 & 80 & 12
\end{array}
\]

TO DECODE THE ANSWERS TO THESE FOUR QUESTIONS:

Write the integer named by any expression below. Find this integer in the code. Each time it appears, write the letter of that expression above it.

KEEP WORKING AND YOU WILL DISCOVER WHAT YOU GET FROM EACH DOUBLE CROSS!

\[
\begin{array}{ccccccccc}
R & \sqrt{36} & = & H & \sqrt{100} - \sqrt{1} & = & M & -\sqrt{8100} = \\
O & \sqrt{64} & = & W & \sqrt{25} - 16 & = & J & -\sqrt{14,400} = \\
E & -\sqrt{36} & = & D & \sqrt{169} - 144 & = & P & \sqrt{2} \cdot \sqrt{2} = \\
T & -\sqrt{64} & = & V & \sqrt{6^2 + 8^2} = & U & \sqrt{23} \cdot \sqrt{23} = \\
C & \sqrt{144} & = & K & \sqrt{900} = & N & \sqrt{15} \cdot \sqrt{15} = \\
I & -\sqrt{49} = & & L & \sqrt{1600} = & A & (\sqrt{80})^2 = \\
Y & \sqrt{81} - \sqrt{4} = & & & & S & (\sqrt{225})^2 = 
\end{array}
\]
What Is Special About the Testing Program at the Acme College of Cosmetics?

TO ANSWER THIS QUESTION, FOLLOW THESE INSTRUCTIONS:
For each exercise, figure out which consecutive integers the square root lies between. Write the letter of the exercise on the number line between these two integers.
Why Did Mergatroid Stand Next To The Bank Vault?

TO ANSWER THIS QUESTION:
Write the letter of each equation in the box above its solution.

<table>
<thead>
<tr>
<th>Number</th>
<th>Square ( n^2 )</th>
<th>Square Root of 10 Times ( n )</th>
<th>Square Root of 10 Times ( n )</th>
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<td>25</td>
<td>625</td>
<td>5.000</td>
<td>15.811</td>
</tr>
</tbody>
</table>

\[ n = \sqrt{17} \]
\[ n = \sqrt{170} \]
\[ n = \sqrt{32} \]
\[ n = \sqrt{320} \]
\[ n = \sqrt{7} \]
\[ n = \sqrt{70} \]
\[ \sqrt{49} = n \]
\[ \sqrt{490} = n \]
\[ \sqrt{n} = 1.414 \]
\[ \sqrt{n} = 6.164 \]
\[ \sqrt{n} = 5.099 \]
\[ \sqrt{n} = 4.000 \]
\[ \sqrt{n} = 12.247 \]
Why Aren’t Elephants Allowed On The Beach?

Circle the letter of the correct choice. Write this letter in each box at the bottom of the page that contains the number of the exercise.

1. If the square root of a number is an integer, the number is called a perfect square. One example of a perfect square is
   (V) 50
   (S) 81

2. The square root of a perfect square is an
   (U) integer
   (B) irrational number

3. Which of the following lists includes only perfect squares?
   (I) 49, 144, 16, 1, 64
   (L) 81, 49, 100, 2, 9

4. Since 2 is not a perfect square, $\sqrt{2}$ is not an integer. The square root of 2 is a number which, when squared, equals exactly
   (R) 4
   (H) 2

5. Let’s try to find $\sqrt{2}$. It must be between
   (A) 1 and 2
   (M) 2 and 3

6. FACT: $(1.4)^2 = 1.96$ and $(1.5)^2 = 2.25$. Therefore, $\sqrt{2}$ is
   (E) between 1.4 and 1.5
   (O) not between 1.4 and 1.5

7. FACT: $(1.41)^2 = 1.9881$ and $(1.42)^2 = 2.0164$. Therefore, $\sqrt{2}$ is
   (C) between 1.41 and 1.42
   (W) not between 1.41 and 1.42

8. FACT: $(1.414)^2 = 1.999396$ and $(1.415)^2 = 2.002225$. Therefore, $\sqrt{2}$ is
   (T) exactly equal to 1.414
   (Y) between 1.414 and 1.415

9. It can be proved that there is no terminating decimal that, when squared, equals exactly 2. So the decimal for $\sqrt{2}$ in a square root table, when squared, equals
   (F) exactly 2
   (R) approximately 2

10. REMEMBER: Every rational number can be represented either by a terminating decimal or by a repeating decimal
    (K) repeating decimal
    (D) nonrepeating decimal

11. There is no terminating decimal that, when squared, equals 2. It can also be proved that there is no repeating decimal that, when squared, equals 2. Therefore, $\sqrt{2}$ is
    (N) a rational number
    (P) not a rational number

12. A decimal that never terminates, and never repeats, represents an irrational number. The decimal for $\sqrt{2}$ never terminates or repeats. Therefore, $\sqrt{2}$ is
    (M) a rational number
    (N) irrational number

13. It can be proved that the square root of every whole number is an irrational number unless the number is
    (T) a perfect square
    (S) not a perfect square
Why Did The Cow Hate The Farmer?

Figure out the length of the hypotenuse of any right triangle below. Find your answer in the answer column and notice the number to the left of it. Each time this number appears in the code, write the letter of the triangle above it. Keep working and you will decode the answer to the title question.

ANSWERS
1. $\sqrt{169} = 13$
2. $\sqrt{625} = 25$
3. $\sqrt{305} \approx 17.5$
4. $\sqrt{277} \approx 16.6$
5. $\sqrt{100} = 10$
6. $\sqrt{233} \approx 15.3$
7. $\sqrt{289} = 17$
8. $\sqrt{136} \approx 11.7$
9. $\sqrt{65} \approx 8.06$
10. $\sqrt{200} \approx 14.1$
11. $\sqrt{170} \approx 13.0$
12. $\sqrt{61} \approx 7.81$
13. $\sqrt{477} \approx 21.8$
14. $\sqrt{205} \approx 14.3$
15. $\sqrt{225} = 15$

3-12-7-9-5-4-1-7-4-12-5-2-10-11-4-7-13-5-4-2-9-11-4-3-12-7-9-7-8-15-10-13-11-9-6-2-2-7-4-14
**Get The Message**

**DIRECTIONS:**
Determine whether or not the given numbers are possible measures for the sides of a right triangle. Circle the appropriate letter next to each set of measures.

When you finish, print the circled letters in the row of boxes at the bottom of the page. **FIRST** print those from the column marked “Right Triangle,” **THEN** print those from the column marked “Not a Right Triangle.”

*A MESSAGE WILL APPEAR!*

<table>
<thead>
<tr>
<th></th>
<th>RIGHT TRIANGLE</th>
<th>NOT A RIGHT TRIANGLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>a = 3, b = 4, c = 5</td>
<td>D</td>
</tr>
<tr>
<td>2</td>
<td>a = 4, b = 5, c = 6</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>a = 5, b = 12, c = 13</td>
<td>R</td>
</tr>
<tr>
<td>4</td>
<td>a = 6, b = 9, c = 11</td>
<td>V</td>
</tr>
<tr>
<td>5</td>
<td>a = 7, b = 24, c = 25</td>
<td>O</td>
</tr>
<tr>
<td>6</td>
<td>a = 8, b = 10, c = 13</td>
<td>A</td>
</tr>
<tr>
<td>7</td>
<td>a = 6, b = 11, c = (\sqrt{157})</td>
<td>L</td>
</tr>
<tr>
<td>8</td>
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<td>E</td>
</tr>
<tr>
<td>9</td>
<td>a = (\sqrt{24}), b = 7, c = 9</td>
<td>R</td>
</tr>
<tr>
<td>10</td>
<td>a = 12, b = 20, c = 24</td>
<td>S</td>
</tr>
<tr>
<td>11</td>
<td>a = 9, b = 40, c = 41</td>
<td>R</td>
</tr>
<tr>
<td>12</td>
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<tr>
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<td>a = 2.2, b = 3, c = 3.8</td>
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</tr>
<tr>
<td>14</td>
<td>a = 10, b = 16, c = (\sqrt{356})</td>
<td>F</td>
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<td>a = 4, b = (\sqrt{150}), c = 13</td>
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<td>18</td>
<td>a = 10, b = 24, c = 26</td>
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</tr>
<tr>
<td>19</td>
<td>a = (\sqrt{7}), b = (\sqrt{8}), c = (\sqrt{14})</td>
<td>E</td>
</tr>
<tr>
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<td>a = 0.8, b = 1.5, c = 1.7</td>
<td>A</td>
</tr>
<tr>
<td>21</td>
<td>a = 4.5, b = 4.5, c = 7</td>
<td>D</td>
</tr>
<tr>
<td>22</td>
<td>a = 1, b = 2, c = 3</td>
<td>L</td>
</tr>
</tbody>
</table>

**FIRST PRINT THE CIRCLED LETTERS FROM THE “RIGHT TRIANGLE” COLUMN, THEN FROM THE OTHER COLUMN.**
What Do Two Bullets Have When They Get Married?

Work each problem and find your answers at the bottom of the page. Shade out the letter above each correct answer. When you finish, the answer to the title question will remain.

1. Find the length of the hypotenuse of each right triangle:

   A.  
   \[
   \text{hypotenuse} = \sqrt{9^2 + 7^2} = \sqrt{82}
   \]

   B.  
   \[
   \text{hypotenuse} = \sqrt{5^2 + 11^2} = \sqrt{146}
   \]

   C.  
   \[
   \text{hypotenuse} = \sqrt{4^2 + 8^2} = \sqrt{80}
   \]

   D.  
   \[
   \text{hypotenuse} = \sqrt{15^2 + 8^2} = \sqrt{289}
   \]

2. A rectangle is 3 meters wide and 10 meters long. How long is the diagonal of the rectangle?

3. A rectangle is 13 centimeters wide and 18 centimeters long. How long is its diagonal?

4. A guy wire is attached to an upright pole 6 meters above the ground. If the wire is anchored to the ground 4 meters from the base of the pole, how long is the wire?

5. A television screen measures 30 cm wide and 22 cm high. What is the diagonal measure of the screen?

6. A ship leaves port and sails 12 kilometers west and then 19 kilometers north. How far is the ship from port?

7. Each side of a checkerboard measures 40 cm. What is the length of its diagonal?

8. An inclined ramp rises 4 meters over a horizontal distance of 9 meters. How long is the ramp?

9. A box is 120 cm long and 25 cm wide. What is the length of the longest ski pole that could be packed to lie flat in the box?

10. The window of a burning building is 24 meters above the ground. The base of a ladder is placed 10 meters from the building. How long must the ladder be to reach the window?
TO DECODE THE MESSAGE AT THE BOTTOM OF THE PAGE:

Figure out the length of the missing side of any right triangle below. Find your answer in the answer column and notice the GREEK LETTER next to it. Each time this GREEK LETTER appears in the code, write the letter of that exercise above it.

KEEP WORKING AND YOU WILL DECODE THE SECRET MESSAGE.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Side A</th>
<th>Side B</th>
<th>Hypotenuse</th>
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<tr>
<td>O</td>
<td>5</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>H</td>
<td>8</td>
<td></td>
<td>(\sqrt{164})</td>
</tr>
<tr>
<td>I</td>
<td>4</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>12</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td>(\sqrt{48})</td>
</tr>
<tr>
<td>K</td>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>U</td>
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<td>1</td>
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<tr>
<td>Y</td>
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<tr>
<td>R</td>
<td>(\sqrt{87})</td>
<td>(\sqrt{57})</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

ANSWERS

\[\begin{align*}
\delta & = \sqrt{156} \div 12.5 \\
\alpha & = \sqrt{3} \div 1.73 \\
\varsigma & = \frac{\sqrt{144}}{12} \\
\theta & = \frac{\sqrt{137}}{11.7} \\
\phi & = \frac{\sqrt{1}}{1} \\
\pi & = \frac{\sqrt{171}}{13.1} \\
\sigma & = \sqrt{49} = 7 \\
\nu & = \frac{\sqrt{51}}{7.14} \\
\varsigma & = \sqrt{16} = 4 \\
\eta & = \frac{\sqrt{95}}{9.74} \\
\epsilon & = \frac{\sqrt{168}}{13.0} \\
\lambda & = \sqrt{81} = 9 \\
\tau & = \frac{\sqrt{169}}{13} \\
\xi & = \frac{\sqrt{150}}{12.2} \\
\kappa & = \sqrt{100} = 10 \\
\mu & = \sqrt{121} = 11 \\
\beta & = \sqrt{2} \div 1.41 \\
\rho & = \sqrt{4} = 2
\end{align*}\]

SECRET MESSAGE

\[
\xi \varepsilon \phi \kappa \sigma \varsigma \pi \varsigma \sigma \eta \alpha \sigma \eta \sigma \mu \sigma \beta \pi \delta \eta \varsigma \varsigma \tau \tau \lambda
\]

\[
\alpha \kappa \pi \lambda \rho \tau \alpha \sigma \nu \nu \phi \kappa \tau \xi \theta \varsigma \kappa \phi \sigma \rho \varsigma \nu \tau \eta
\]
What Did Lancelot Say To The Beautiful Ellen?

TO ANSWER THIS QUESTION:
Cross out the box containing the answer to each problem. When you finish, write the letters from the boxes that are not crossed out in the boxes at the bottom of the page.

1. For each right triangle, find the length of the side that is not given:

   \[ \triangle A \]
   \[ \begin{array}{c}
   10 \text{ m} \\
   6 \text{ m}
   \end{array} \]

   \[ \triangle B \]
   \[ \begin{array}{c}
   7 \text{ m} \\
   12 \text{ m}
   \end{array} \]

   \[ \triangle C \]
   \[ \begin{array}{c}
   13 \text{ m} \\
   6 \text{ m}
   \end{array} \]

   \[ \triangle D \]
   \[ \begin{array}{c}
   11 \text{ m} \\
   9 \text{ m}
   \end{array} \]

2. The bases on a baseball diamond are 90 feet apart. How far is it from home plate to second base?

3. Orgo has let out 50 meters of kite string when he observes that his kite is directly above Zorna. If Orgo is 35 meters from Zorna, how high is the kite?

4. A What is the height of this parallelogram?
   B What is the area of the parallelogram?

5. An 18-foot ladder is leaned against a wall. If the base of the ladder is 8 feet from the wall, how high up on the wall will the ladder reach?

6. A quarterback at point A throws the football to a receiver who catches it at point B. How long was the pass?

7. From Canoeville it is 2.4 kilometers to White Beach and 3.0 kilometers to the Lodge. How far is it from White Beach across the lake to the Lodge?

<table>
<thead>
<tr>
<th>ST</th>
<th>IC</th>
<th>KW</th>
<th>QU</th>
<th>IT</th>
<th>UR</th>
<th>AT</th>
<th>GR</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \sqrt{821} \text{ yd} )</td>
<td>( \sqrt{3.16} \text{ km} )</td>
<td>( \sqrt{144} \text{ m} )</td>
<td>( \sqrt{136} \text{ m} )</td>
<td>( \sqrt{3.24} \text{ km} )</td>
<td>( \sqrt{842} \text{ yd} )</td>
<td>( \sqrt{16200'} )</td>
<td>( \sqrt{95} \text{ m} )</td>
</tr>
<tr>
<td>( \approx 28.7 \text{ yd} )</td>
<td>( \approx 1.78 \text{ km} )</td>
<td>( = 12 \text{ m} )</td>
<td>( = 11.7 \text{ m} )</td>
<td>( = 1.8 \text{ km} )</td>
<td>( = 29.0 \text{ yd} )</td>
<td>( = 127' )</td>
<td>( = 9.75 \text{ m} )</td>
</tr>
<tr>
<td>AB</td>
<td>EA</td>
<td>TC</td>
<td>UT</td>
<td>ER</td>
<td>EA</td>
<td>LN</td>
<td>GT</td>
</tr>
<tr>
<td>( \sqrt{105} \text{ m} )</td>
<td>( \sqrt{260} \text{ m} )</td>
<td>( \sqrt{275'} \text{ m} )</td>
<td>( \sqrt{1275} \text{ m} )</td>
<td>( \sqrt{1325} \text{ m} )</td>
<td>( \sqrt{35.7} \text{ m} )</td>
<td>( \sqrt{36.4} \text{ m} )</td>
<td>( \approx 6.32 \text{ m} )</td>
</tr>
</tbody>
</table>

234 m²
Why Did the Saltine Lock Itself in the Bank Vault?

TO ANSWER THIS QUESTION, FOLLOW THESE INSTRUCTIONS:
For each exercise, select the correct ratio from the four choices given. Write the letter of the correct choice in the box that contains the number of the exercise.

1. \( \sin A \)  
   - \( \frac{\sqrt{3}}{2} \)  
   - \( \frac{5}{13} \)  
   - \( \frac{4}{5} \)  
   - \( \frac{3}{5} \)

2. \( \cos A \)  
   - \( \frac{\sqrt{2}}{2} \)  
   - \( \frac{13}{5} \)  
   - \( \frac{5}{13} \)  
   - \( \frac{12}{13} \)

3. \( \tan A \)  
   - \( \frac{\sqrt{2}}{3} \)  
   - \( \frac{5}{12} \)  
   - \( \frac{5}{12} \)  
   - \( \frac{5}{12} \)

4. \( \sin B \)  
   - \( \frac{\sqrt{2}}{2} \)  
   - \( \frac{13}{5} \)  
   - \( \frac{5}{13} \)  
   - \( \frac{12}{13} \)

5. \( \cos B \)  
   - \( \frac{\sqrt{2}}{2} \)  
   - \( \frac{13}{5} \)  
   - \( \frac{5}{13} \)  
   - \( \frac{12}{13} \)

6. \( \tan B \)  
   - \( \frac{\sqrt{2}}{3} \)  
   - \( \frac{5}{12} \)  
   - \( \frac{5}{12} \)  
   - \( \frac{5}{12} \)

7. \( \sin A \)  
   - \( \frac{\sqrt{2}}{2} \)  
   - \( \frac{13}{5} \)  
   - \( \frac{5}{13} \)  
   - \( \frac{12}{13} \)

8. \( \cos A \)  
   - \( \frac{\sqrt{2}}{2} \)  
   - \( \frac{13}{5} \)  
   - \( \frac{5}{13} \)  
   - \( \frac{12}{13} \)

9. \( \tan A \)  
   - \( \frac{\sqrt{2}}{3} \)  
   - \( \frac{5}{12} \)  
   - \( \frac{5}{12} \)  
   - \( \frac{5}{12} \)

10. \( \sin B \)  
    - \( \frac{\sqrt{2}}{2} \)  
    - \( \frac{13}{5} \)  
    - \( \frac{5}{13} \)  
    - \( \frac{12}{13} \)

11. \( \cos B \)  
    - \( \frac{\sqrt{2}}{2} \)  
    - \( \frac{13}{5} \)  
    - \( \frac{5}{13} \)  
    - \( \frac{12}{13} \)

12. \( \tan B \)  
    - \( \frac{\sqrt{2}}{3} \)  
    - \( \frac{5}{12} \)  
    - \( \frac{5}{12} \)  
    - \( \frac{5}{12} \)
What Did The Leopard Say After Lunch?

TO ANSWER THIS QUESTION:

Use the table of trigonometric ratios to do each exercise. Find each answer at the bottom of the page and write the corresponding letter above it.

Find the following:

\[ \text{L} \sin 35^\circ \quad \text{T} \tan 10^\circ \quad \text{E} \cos 65^\circ \]

\[ \text{A} \cos 70^\circ \quad \text{I} \sin 85^\circ \quad \text{T} \tan 50^\circ \]

Use the figure at the right for the remaining problems.

\[ \text{A} \text{ If } m \angle A = 40^\circ, \text{ then } \frac{a}{c} = \]

\[ \text{H} \text{ If } \frac{a}{c} = 0.966, \text{ then } m \angle A = \]

\[ \text{T} \text{ If } m \angle A = 55^\circ, \text{ then } \frac{a}{c} = \]

\[ \text{E} \text{ If } \frac{a}{c} = 0.707, \text{ then } m \angle A = \]

\[ \text{T} \text{ If } m \angle A = 80^\circ, \text{ then } \frac{b}{c} = \]

\[ \text{Y} \text{ If } \frac{b}{c} = 0.500, \text{ then } m \angle A = \]

\[ \text{O} \text{ If } m \angle A = 25^\circ, \text{ then } \frac{a}{b} = \]

\[ \text{T} \text{ If } \frac{a}{b} = 1.428, \text{ then } m \angle A = \]

\[ \text{H} \text{ If } m \angle B = 30^\circ, \text{ then } \frac{a}{c} = \]

\[ \text{L} \text{ If } \frac{a}{c} = 0.996, \text{ then } m \angle B = \]

\[ \text{R} \text{ If } m \angle B = 75^\circ, \text{ then } \frac{b}{a} = \]

\[ \text{S} \text{ If } \frac{b}{a} = 0.839, \text{ then } m \angle B = \]

\[ \text{H} \text{ If } m \angle B = 15^\circ, \text{ then } \frac{b}{c} = \]

\[ \text{P} \text{ If } \frac{b}{c} = 0.906, \text{ then } m \angle B = \]

\[ \begin{array}{|c|c|c|c|}
\hline
\text{Angle} & \text{Sin} & \text{Cos} & \text{Tan} \\
\hline
0^\circ & 0.000 & 1.000 & 0.000 \\
5^\circ & 0.087 & 0.996 & 0.087 \\
10^\circ & 0.174 & 0.985 & 0.176 \\
15^\circ & 0.259 & 0.966 & 0.268 \\
20^\circ & 0.342 & 0.940 & 0.364 \\
25^\circ & 0.423 & 0.906 & 0.466 \\
30^\circ & 0.500 & 0.866 & 0.577 \\
35^\circ & 0.574 & 0.819 & 0.700 \\
40^\circ & 0.643 & 0.766 & 0.839 \\
45^\circ & 0.707 & 0.707 & 1.000 \\
50^\circ & 0.766 & 0.643 & 1.192 \\
55^\circ & 0.819 & 0.574 & 1.428 \\
60^\circ & 0.866 & 0.500 & 1.732 \\
65^\circ & 0.906 & 0.423 & 2.145 \\
70^\circ & 0.940 & 0.342 & 2.747 \\
75^\circ & 0.966 & 0.259 & 3.732 \\
80^\circ & 0.985 & 0.174 & 5.671 \\
85^\circ & 0.996 & 0.087 & 11.430 \\
90^\circ & 1.000 & 0.000 & -----
\hline
\end{array} \]

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**Did You Hear About...**

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>I</td>
<td>J</td>
<td>K</td>
<td>L</td>
<td>M</td>
<td>?</td>
<td></td>
</tr>
</tbody>
</table>

**DIRECTIONS:**

In any triangle below, find the length \( x \). Round it to the nearest 0.1 meter. Find your answer in the answer column and notice the word next to it. Write this word in the box that has the same letter as that triangle.

*KEEP WORKING AND YOU WILL HEAR ABOUT A NOVEL NAME!*

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10 m</td>
<td>23 m</td>
<td>25 m</td>
<td>30 m</td>
<td>23.8 m</td>
<td>46.2 m</td>
<td>22.7 m</td>
<td>44.9 m</td>
</tr>
<tr>
<td>34°</td>
<td>30°</td>
<td>48°</td>
<td>48°</td>
<td>56°</td>
<td>23°</td>
<td>13°</td>
<td>13°</td>
</tr>
</tbody>
</table>

**A**

\[ x = 10 \text{ m} \]

**B**

\[ x = 12 \text{ m} \]

**C**

\[ x = 30 \text{ m} \]

**D**

\[ x = 15 \text{ m} \]

**E**

\[ x = 8 \text{ m} \]

**F**

\[ x = 25 \text{ m} \]

**G**

\[ x = 100 \text{ m} \]

**H**

\[ x = 75 \text{ m} \]

**I**

\[ x = 30 \text{ m} \]

**J**

\[ x = 4 \text{ m} \]

**K**

\[ x = 18 \text{ m} \]

**L**

A submarine dives at an angle of 13°. How far is it beneath the surface at a point 500 meters along the surface from where it submerged?

\[ x = 500 \text{ m} \]

**M**

At a point 20 meters from a flagpole, the angle of elevation of the top of the flagpole is 50°. How tall is the flagpole?

\[ x = 20 \text{ m} \]

---

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Books Never Written

My Life in the Jungle by

Over the Cliff by

Catching Butterflies by

ABOVE ARE THE TITLES OF THREE “BOOKS NEVER WRITTEN.” TO DECODE THE NAMES OF THEIR AUTHORS, FOLLOW THESE DIRECTIONS:

In any triangle below, find the measure of the lettered angle to the nearest degree. Each time this measure appears in the code, write the letter above it. Keep working and you will decode the names of all three authors.

A driveway is built on an incline so that it rises 2 meters over a distance of 20 meters. What is the degree measure of the slope of the driveway? (See figure below.)
What Dance Should You Do When Summer Is Over?

Solve each problem and find your answers at the bottom of the page. (Round each mean to the nearest 0.1 unit.) Shade out the letter above each correct answer. When you finish, the answer to the title question will remain. Now, get mean!

1. Nero, Hero, and Zero each bowled three games.
   A. What is Nero’s mean score?
   B. What is Hero’s mean score?
   C. What is Zero’s mean score?

<table>
<thead>
<tr>
<th>Name</th>
<th>Game 1</th>
<th>Game 2</th>
<th>Game 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nero</td>
<td>157</td>
<td>125</td>
<td>146</td>
</tr>
<tr>
<td>Hero</td>
<td>133</td>
<td>160</td>
<td>167</td>
</tr>
<tr>
<td>Zero</td>
<td>144</td>
<td>151</td>
<td>122</td>
</tr>
</tbody>
</table>

2. The scores on a mathematics test for a group of students were 85, 92, 67, 81, 90, 76, 94, 85, 56, and 79.
   A. What is the range of the scores?
   B. What is the mean score?

3. The diameter of each of the 9 planets and the escape velocity from each planet are given in the table. (The escape velocity is the speed necessary to escape the gravitational pull of the planet.)
   A. What is the range of the diameters?
   B. What is the mean diameter?
   C. What is the range of the escape velocities?
   D. What is the mean escape velocity?

<table>
<thead>
<tr>
<th>Planet</th>
<th>Diameter (km)</th>
<th>Escape Velocity (km/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>5,000</td>
<td>4.2</td>
</tr>
<tr>
<td>Venus</td>
<td>12,200</td>
<td>10.3</td>
</tr>
<tr>
<td>Earth</td>
<td>12,757</td>
<td>11.3</td>
</tr>
<tr>
<td>Mars</td>
<td>6,750</td>
<td>5.0</td>
</tr>
<tr>
<td>Jupiter</td>
<td>142,900</td>
<td>60.5</td>
</tr>
<tr>
<td>Saturn</td>
<td>120,900</td>
<td>35.2</td>
</tr>
<tr>
<td>Uranus</td>
<td>46,500</td>
<td>21.7</td>
</tr>
<tr>
<td>Neptune</td>
<td>45,000</td>
<td>24.0</td>
</tr>
<tr>
<td>Pluto</td>
<td>6,500</td>
<td>4.9</td>
</tr>
</tbody>
</table>

4. What is the mean number of letters in the words of this sentence?

5. The height and weight of the starting players on the Big Buckets basketball team are given in the table.
   A. What is the range of the heights?
   B. What is the mean height?
   C. What is the range of the weights?
   D. What is the mean weight?

<table>
<thead>
<tr>
<th>Position</th>
<th>Height (cm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center</td>
<td>206</td>
<td>91.8</td>
</tr>
<tr>
<td>Forward</td>
<td>193</td>
<td>85.3</td>
</tr>
<tr>
<td>Forward</td>
<td>198</td>
<td>84.9</td>
</tr>
<tr>
<td>Guard</td>
<td>172</td>
<td>78.0</td>
</tr>
<tr>
<td>Guard</td>
<td>190</td>
<td>81.5</td>
</tr>
</tbody>
</table>
What Happened After Orgo Bought Snow Tires?

Cross out each box containing the correct answer to an exercise. When you finish, write the letters from the boxes that are not crossed out in the boxes at the bottom of the page.

1. Find the median for each set of numbers.
   A. \{26, 34, 45, 61, 69\}
   B. \{1.8, 1.9, 2.3, 2.5, 2.9, 3.4, 4.2, 4.8\}
   C. \{3, 7, 7, 12, 15, 16, 18, 18, 18, 23, 31\}
   D. \{5.4, 2.5, 3.6, 9.7, 6.1, 5.8, 1.3, 8.8, 2.5, 7.4\}

E. Price of Record Album “X” at various stores

<table>
<thead>
<tr>
<th>Price</th>
<th>Various Stores</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4.69</td>
<td>6.50</td>
</tr>
<tr>
<td>5.50</td>
<td>5.98</td>
</tr>
<tr>
<td>4.49</td>
<td>5.25</td>
</tr>
<tr>
<td>4.95</td>
<td>5.29</td>
</tr>
</tbody>
</table>

2. Five people earn the salaries given in the table.
   A. What is the mean salary?
   B. What is the median salary?

<table>
<thead>
<tr>
<th>Salary</th>
<th>President</th>
<th>Lawyer</th>
<th>Accountant</th>
<th>Secretary</th>
<th>Custodian</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$420,000</td>
<td>35,000</td>
<td>20,000</td>
<td>14,000</td>
<td>11,000</td>
</tr>
</tbody>
</table>

3. Find the mode of each set of numbers.

<table>
<thead>
<tr>
<th>Test Scores</th>
<th>A. 62 77 89</th>
<th>B. 1.47 1.55 1.65 1.72</th>
<th>C. 9 10 5 7 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>67 80 89</td>
<td>1.48 1.58 1.66 1.72</td>
<td>2 3 5 6 4</td>
</tr>
<tr>
<td></td>
<td>69 83 92</td>
<td>1.48 1.58 1.66 1.75</td>
<td>7 8 5 4 6</td>
</tr>
<tr>
<td></td>
<td>69 85 93</td>
<td>1.53 1.60 1.66 1.78</td>
<td>6 7 9 11 9</td>
</tr>
<tr>
<td></td>
<td>75 85 95</td>
<td>1.53 1.64 1.69 1.81</td>
<td>6 8 12 9 7</td>
</tr>
<tr>
<td></td>
<td>77 89 95</td>
<td>1.54 1.65 1.70 1.88</td>
<td>4 11 10 8 3</td>
</tr>
</tbody>
</table>

4. The rainfall for a city is given in the table. Find the following:
   A. The mean rainfall per month
   B. The median rainfall per month
   C. The mode of the rainfall measurements

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (cm)</th>
<th>Month</th>
<th>Rainfall (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>8.6</td>
<td>July</td>
<td>2.4</td>
</tr>
<tr>
<td>February</td>
<td>9.5</td>
<td>August</td>
<td>2.4</td>
</tr>
<tr>
<td>March</td>
<td>12.1</td>
<td>September</td>
<td>6.2</td>
</tr>
<tr>
<td>April</td>
<td>14.7</td>
<td>October</td>
<td>12.3</td>
</tr>
<tr>
<td>May</td>
<td>9.3</td>
<td>November</td>
<td>11.9</td>
</tr>
<tr>
<td>June</td>
<td>5.0</td>
<td>December</td>
<td>10.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HE 1.66 m</th>
<th>PU 5.6</th>
<th>TH 1.65 m</th>
<th>AT $5.10</th>
<th>SL 15.5</th>
<th>EY 69</th>
<th>SO 2.4 cm</th>
<th>ME 9.1 cm</th>
<th>ID $100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA $20,000</td>
<td>LL 45</td>
<td>FE 7</td>
<td>LT $5.20</td>
<td>IR 89</td>
<td>SN 8.7 cm</td>
<td>SN 2.7</td>
<td>OW 9.4 cm</td>
<td>ED $90,000</td>
</tr>
</tbody>
</table>

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What Happens When Joggers Get Mad?

Complete each table. Write the letter of each table value in the box above the corresponding value at the bottom of the page. Make a histogram for each set of data.

<table>
<thead>
<tr>
<th>Test Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
</tr>
<tr>
<td>85</td>
</tr>
<tr>
<td>92</td>
</tr>
<tr>
<td>54</td>
</tr>
<tr>
<td>79</td>
</tr>
<tr>
<td>73</td>
</tr>
<tr>
<td>84</td>
</tr>
<tr>
<td>89</td>
</tr>
</tbody>
</table>

Score | Tally | Frequency | Percent |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>41-50</td>
<td>(P)</td>
<td>(J)</td>
<td></td>
</tr>
<tr>
<td>51-60</td>
<td>(A)</td>
<td>(Y)</td>
<td></td>
</tr>
<tr>
<td>61-70</td>
<td>(I)</td>
<td>(E)</td>
<td></td>
</tr>
<tr>
<td>71-80</td>
<td>(E)</td>
<td>(A)</td>
<td></td>
</tr>
<tr>
<td>81-90</td>
<td>(T)</td>
<td>(H)</td>
<td></td>
</tr>
<tr>
<td>91-100</td>
<td>(A)</td>
<td>(V)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Foot Lengths (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>181-190</td>
</tr>
<tr>
<td>191-200</td>
</tr>
<tr>
<td>201-210</td>
</tr>
<tr>
<td>211-220</td>
</tr>
<tr>
<td>221-230</td>
</tr>
<tr>
<td>231-240</td>
</tr>
<tr>
<td>241-250</td>
</tr>
<tr>
<td>251-260</td>
</tr>
</tbody>
</table>
What is a HlbVE?

CIRCLE the letter of the best answer for each exercise. Write the letter in each box that contains the number of the exercise.

1. What was the closing price for TNT stock on Monday?
   (F) $37.00   (N) $36.50

2. What was the closing price for UFO stock on Wednesday?
   (G) $32.75   (S) $32.25

3. On what day was the closing price for TNT stock $37.25 per share?
   (A) Tuesday   (T) Thursday

4. What was the range of the closing prices for UFO stock during the week?
   (R) $2.00   (V) $2.50

5. What was the mean of the closing prices for UFO stock during the week?
   (T) $33.25   (L) $33.45

6. What was the median of the closing prices for TNT stock during the week?
   (D) $37.25   (S) $37.00

7. Give an estimate of the colonial population in 1660.
   (E) 75,000   (O) 50,000

8. In what year was the colonial population about 210,000?
   (P) 1680   (H) 1690

9. Give an estimate of the increase in population from 1620 to 1720.
   (T) 460,000   (M) 460,000

10. Based on the graph, what is a reasonable estimate for the colonial population in 1730?
    (O) 500,000   (I) 600,000

11. The population in 1650 was about what percent of the population in 1700?
    (B) 20%   (F) 25%
What is Green, has six legs, and a Trunk?

CIRCLE the letter of the best answer for each exercise. Write this letter in each box at the bottom of the page that contains the number of the exercise.

1. What is the mean height of babies at age 6 months?
   (P) 67 cm (O) 68 cm

2. At what age is the mean height about 75 centimeters?
   (L) 11 mo. (A) 12 mo.

3. On the average, about how many centimeters do babies grow during the first year?
   (C) 25 cm (L) 30 cm

4. The height of babies at birth is about what percent of their height at 12 months?
   (S) 75% (E) 66%

5. Based on the graph, what is a reasonable estimate for the mean height of 13-month-old babies?
   (H) 77 cm (N) 79 cm

6. What was the temperature at 7 P.M.?
   (U) 11°C (T) 12°C

7. What was the temperature at 3 A.M.?
   (A) −4°C (M) −2°C

8. When was the temperature 0°C?
   (L) 1 A.M. (R) 7 A.M.

9. What is the range of the temperatures recorded during the day?
   (Y) 19°C (K) 21°C

10. What is the mean of the temperatures recorded from noon through 7 P.M.?
    (S) 13.9°C (T) 13.6°C

11. What is the median of the temperatures recorded from noon through midnight?
    (S) 12°C (P) 13°C
Why did Orgo put DYNAMITE under his PANCAKES?

Complete each table. (Round the measure of each central angle to the nearest degree.) Write the letter of each table value in the box above the corresponding value at the bottom of the page.

Kermit's Monthly Budget ($500 total)

<table>
<thead>
<tr>
<th>Item</th>
<th>Percent of total</th>
<th>Amount (dollars)</th>
<th>Central angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fly Traps</td>
<td>(D)</td>
<td>(A)</td>
<td></td>
</tr>
<tr>
<td>Pond Fees</td>
<td>(O)</td>
<td>(E)</td>
<td></td>
</tr>
<tr>
<td>Agent</td>
<td>(T)</td>
<td>(I)</td>
<td></td>
</tr>
<tr>
<td>Singing Lessons</td>
<td>(C)</td>
<td>(E)</td>
<td>(S)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td>$500</td>
<td>360°</td>
</tr>
</tbody>
</table>

Recipe for a Fruit Salad (40 oz. total)

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Percent of total</th>
<th>Amount (ounces)</th>
<th>Central angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peaches</td>
<td>(A)</td>
<td>(W)</td>
<td></td>
</tr>
<tr>
<td>Bananas</td>
<td>(O)</td>
<td>(H)</td>
<td></td>
</tr>
<tr>
<td>Melons</td>
<td>(T)</td>
<td>(K)</td>
<td></td>
</tr>
<tr>
<td>Grapes</td>
<td>(W)</td>
<td>(H)</td>
<td></td>
</tr>
<tr>
<td>Apples</td>
<td>(B)</td>
<td>(T)</td>
<td>(L)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>(N)</td>
<td>40 oz</td>
<td>(S)</td>
</tr>
</tbody>
</table>
What Happened When
1000 Baseballs Fell From An Airplane?

Compute the measure of each central angle (rounded to the nearest degree). Find your answer in the answer column and notice the letter next to it. Write this letter in each box at the bottom of the page that contains the number of that exercise. Construct a circle graph for each set of data.

### Use of Acreage on a Farm

<table>
<thead>
<tr>
<th>Use</th>
<th>% of total</th>
<th>Central angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>30%</td>
<td>(1)</td>
</tr>
<tr>
<td>Wheat</td>
<td>21%</td>
<td>(2)</td>
</tr>
<tr>
<td>Barley</td>
<td>23%</td>
<td>(3)</td>
</tr>
<tr>
<td>Pasture</td>
<td>17%</td>
<td>(4)</td>
</tr>
<tr>
<td>Woodland</td>
<td>9%</td>
<td>(5)</td>
</tr>
</tbody>
</table>

### Favorite Type of Music
(results of a survey)

<table>
<thead>
<tr>
<th>Type</th>
<th>% of total</th>
<th>Central angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Folk</td>
<td>24%</td>
<td>(6)</td>
</tr>
<tr>
<td>Rock</td>
<td>41%</td>
<td>(7)</td>
</tr>
<tr>
<td>Jazz</td>
<td>6%</td>
<td>(8)</td>
</tr>
<tr>
<td>Country</td>
<td>18%</td>
<td>(9)</td>
</tr>
<tr>
<td>Classical</td>
<td>11%</td>
<td>(10)</td>
</tr>
</tbody>
</table>

### Ziggy's Budget

<table>
<thead>
<tr>
<th>Item</th>
<th>% of total</th>
<th>Central angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>25%</td>
<td>(11)</td>
</tr>
<tr>
<td>Clothes</td>
<td>20%</td>
<td>(12)</td>
</tr>
<tr>
<td>Hobbies</td>
<td>10%</td>
<td>(13)</td>
</tr>
<tr>
<td>Dates</td>
<td>33%</td>
<td>(14)</td>
</tr>
<tr>
<td>Savings</td>
<td>5%</td>
<td>(15)</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>(16)</td>
</tr>
</tbody>
</table>

### ANSWERS

- A: 16°
- I: 18°
- Y: 22°
- L: 25°
- M: 28°
- S: 32°
- D: 36°
- F: 40°
- B: 53°
- E: 61°
- T: 65°
- P: 72°
- C: 74°
- O: 76°
- K: 83°
- W: 86°
- H: 90°
- N: 108°
- R: 119°
- U: 128°
- G: 148°
**Why Does LIGHTNING Shock People?**

Complete each table. (Round the measure of each central angle to the nearest degree.) Write the letter of each table value in the box below the corresponding value at the bottom of the page. Construct a circle graph for each set of data.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of hours</th>
<th>Fraction of total</th>
<th>Percent of total</th>
<th>Central angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep</td>
<td>9</td>
<td>(T)</td>
<td>(O)</td>
<td>(D)</td>
</tr>
<tr>
<td>Eating</td>
<td>2</td>
<td>(W)</td>
<td>(N)</td>
<td>(I)</td>
</tr>
<tr>
<td>School</td>
<td>6</td>
<td>(O)</td>
<td>(T)</td>
<td>(U)</td>
</tr>
<tr>
<td>Homework</td>
<td>3</td>
<td>(N)</td>
<td>(S)</td>
<td>(O)</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>(E)</td>
<td>(T)</td>
<td>(I)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>24</td>
<td>1</td>
<td>100%</td>
<td>360°</td>
</tr>
</tbody>
</table>

**Zoma's Day**

<table>
<thead>
<tr>
<th>Age group</th>
<th>Number of people</th>
<th>Fraction of total</th>
<th>Percent of total</th>
<th>Central angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-19</td>
<td>960</td>
<td>(L)</td>
<td>(O)</td>
<td>(N)</td>
</tr>
<tr>
<td>20-39</td>
<td>1000</td>
<td>(T)</td>
<td>(W)</td>
<td>(T)</td>
</tr>
<tr>
<td>40-59</td>
<td>630</td>
<td>(O)</td>
<td>(K)</td>
<td>(F)</td>
</tr>
<tr>
<td>60-79</td>
<td>360</td>
<td>(E)</td>
<td>(C)</td>
<td>(H)</td>
</tr>
<tr>
<td>80 &amp; over</td>
<td>50</td>
<td>(S)</td>
<td>(D)</td>
<td>(C)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3000</td>
<td>1</td>
<td>100%</td>
<td>360°</td>
</tr>
</tbody>
</table>

**Population of Orgoville (by age groups)**

<table>
<thead>
<tr>
<th>Degree</th>
<th>Percent</th>
<th>Central angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>60°</td>
<td>21%</td>
<td>1/60</td>
</tr>
<tr>
<td>120°</td>
<td>1/8</td>
<td>1/4</td>
</tr>
<tr>
<td>135°</td>
<td>33 1/3%</td>
<td>1/3</td>
</tr>
<tr>
<td>12 1/2%</td>
<td>90°</td>
<td>3/8</td>
</tr>
<tr>
<td>225°</td>
<td>12%</td>
<td>8/25</td>
</tr>
<tr>
<td>215°</td>
<td>1/8</td>
<td>1/8</td>
</tr>
<tr>
<td>315°</td>
<td>43°</td>
<td>1/4</td>
</tr>
<tr>
<td>33 1/3%</td>
<td>33 1/3%</td>
<td>1/60</td>
</tr>
<tr>
<td>1/2</td>
<td>12°</td>
<td>1/12</td>
</tr>
<tr>
<td>32°</td>
<td>45°</td>
<td>1/3</td>
</tr>
<tr>
<td>8 1/3%</td>
<td>6°</td>
<td>1/3</td>
</tr>
<tr>
<td>1 2/3%</td>
<td>90°</td>
<td>3/8</td>
</tr>
<tr>
<td>3/8</td>
<td>30°</td>
<td>8/25</td>
</tr>
<tr>
<td>16 2/3%</td>
<td>76°</td>
<td>1/12</td>
</tr>
</tbody>
</table>

PRE-ALGEBRA WITH PIZAZZ! © Creative Publications
1. How many regular hexagons can you count in this figure?

2. Mr. Black, Mr. Brown, and Mr. Green were lunching together. One of them was wearing a black tie, one a brown tie, and one a green tie. Suddenly the man wearing the green tie noticed something.

"Do you realize," he said, "we are wearing ties that match our names, but not one of us is wearing a tie to match his own name."

"What a curious thing!" exclaimed Mr. Black.

What color tie was each man wearing?

3. Four stamps can be attached to each other in various ways. One way is shown here. In how many other ways might four stamps be attached?

4. As a prize, a contest winner is to draw one bill at a time from a box containing ten $5 bills, ten $10 bills, and ten $20 bills. The drawing ends when 3 bills of the same denomination are drawn.

What is the largest sum of money that can be won under these conditions?

5. What is the next figure in this series?

6. What is the greatest amount of money you can have (in pennies, nickels, dimes, quarters, and half dollars) and still not be able to give change for a dollar?

7. The figure below represents a cube that measures 3 cm on each edge. Suppose the entire cube is painted red. It is then cut up into 27 smaller cubes, each 1 cm on each edge.

How many of these 27 cubes have 3 red sides? How many have 2 red sides? How many have 1 red side? How many have no red sides?

8. It takes 4.5 hours for a jet to fly from coast to coast. One jet leaves Los Angeles for New York at 4:40 P.M., while another jet leaves New York for Los Angeles at 6:00 P.M. Which plane will be closer to New York when they pass each other?

**SCORING KEY**

7 or 8 — **Superstar Genius**
5 or 6 — **Star Genius**
3 or 4 — **Genius**
2 or less — **Genius of the Future**
CRYPTIC QUIZ

1. How Did Alfo Make A Quart Of Juice From Three Oranges?

**ANSWER:**

99-7-20-18-25-18-7-99-14-15-7-25-38-45-6-6-5-6

2. What Do You Get When The Post Office Burns Down?

**ANSWER:**


3. What Do Gorillas Sleep On In Fruit Orchards?

**ANSWER:**

18-72-27-99-24-13-7-25

**To Decode the Answers to These Questions:**

Simplify any expression below and find your answer in the code. Each time the answer appears, write the letter of that expression above it. Keep working and you will decode the three answers.

- **P** (16 - 7) \( \times 8 =
- **L** 12 + (36 ÷ 9) =
- **G** 28 ÷ (10 - 8) =
- **U** 9 (15 ÷ 3) =
- **W** \( [(48 + 2) \times 2] \div 5 =
- **I** (8 + 3) \( \cdot (16 - 7) =
- **H** (20 ÷ 6) ÷ (6 + 2) =
- **D** \( [45 - (3 \cdot 2)] \div 3 =
- **Z** 2 + \( [48 ÷ (12 + 4)] =
- **F** 3 \( \times 2 \ [4 + (9 ÷ 3)] =
- **C** 72 ÷ \( \left( \frac{29 + 7}{4 \times 3} \right) =
- **Q** \( 35 + \frac{50 + 25}{5 \cdot 5} =
- **K** \( 80 - [3 (8 + 7)] =
- **E** \( [5 (20 - 2)] \div \frac{30}{2} =
- **M** 3 \( [4 (9 - 2)] =
- **R** \( \frac{2 \ [ (7 \cdot 3) + 6] }{26 ÷ 13} =
- **B** 5 + \( [4 \cdot 3 (2 + 1)] =
- **T** \( \frac{7(8 - 1) + (42 ÷ 3)}{(10 - 7)3} =
- **S** \( 50 ÷ \left[ (4 \cdot 5) - (36 ÷ 2) \right] =
- **A** \( \left[ \frac{3 (12 - 7)}{2 + 3} \right] \times 6 =

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180
Why Did Everybody Hate The Diaper Thief?

Simplify any expression below and find your answer in the corresponding answer column. Write the letter of the exercise in the box that contains the number of the answer. Keep working and you will discover the answer to the title question.

<table>
<thead>
<tr>
<th>S</th>
<th>5x + 2 + 3x</th>
<th>15</th>
<th>4x + 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>3 + 7x + 8</td>
<td>5</td>
<td>7x + 11</td>
</tr>
<tr>
<td>E</td>
<td>9 + 6x + 2x</td>
<td>13</td>
<td>5x + 7</td>
</tr>
<tr>
<td>I</td>
<td>4x + 7 + 4</td>
<td>28</td>
<td>8x + 9</td>
</tr>
<tr>
<td>O</td>
<td>9x + 3 + 7x + 4</td>
<td>11</td>
<td>3x + 10</td>
</tr>
<tr>
<td>T</td>
<td>x + 3x + 6</td>
<td>17</td>
<td>8x + 2</td>
</tr>
<tr>
<td>A</td>
<td>4x + 7 + x</td>
<td>23</td>
<td>16x + 7</td>
</tr>
<tr>
<td>Y</td>
<td>9 + x + 1 + 2x</td>
<td>29</td>
<td>4x + 6</td>
</tr>
<tr>
<td>I</td>
<td>3t + 4v + 5t</td>
<td>2</td>
<td>8t + 5v + 6</td>
</tr>
<tr>
<td>A</td>
<td>7t + 6 + 3v + 6v</td>
<td>21</td>
<td>7t + 18v</td>
</tr>
<tr>
<td>S</td>
<td>6v + 5t + 8v + 2t</td>
<td>10</td>
<td>4t + 8v</td>
</tr>
<tr>
<td>H</td>
<td>3t + 9v + 4t + 9v</td>
<td>26</td>
<td>7t + 9v + 6</td>
</tr>
<tr>
<td>E</td>
<td>t + 5v + 6 + 7t</td>
<td>18</td>
<td>t + 2v + 15</td>
</tr>
<tr>
<td>O</td>
<td>8 + 4v + 9t + v</td>
<td>32</td>
<td>9t + 5v + 8</td>
</tr>
<tr>
<td>T</td>
<td>3t + v + t + 7v</td>
<td>19</td>
<td>8t + 4v</td>
</tr>
<tr>
<td>W</td>
<td>2v + 8 + t + 7</td>
<td>7</td>
<td>7t + 14v</td>
</tr>
<tr>
<td>N</td>
<td>3z + 6u + 8z + 9 + u</td>
<td>27</td>
<td>8u + 5z + 15</td>
</tr>
<tr>
<td>T</td>
<td>4 + 3z + 7z + 8 + 4z</td>
<td>6</td>
<td>14z + 12</td>
</tr>
<tr>
<td>E</td>
<td>5u + 3z + 9 + 9z + 9u</td>
<td>31</td>
<td>7u + 16z</td>
</tr>
<tr>
<td>C</td>
<td>z + 6 + 4z + 9 + 8u</td>
<td>4</td>
<td>14u + 12z + 9</td>
</tr>
<tr>
<td>B</td>
<td>9 + 6u + 3z + 8u + z</td>
<td>25</td>
<td>12u + 11z</td>
</tr>
<tr>
<td>O</td>
<td>2u + 4 + 3z + 6 + 9</td>
<td>22</td>
<td>7u + 11z + 9</td>
</tr>
<tr>
<td>L</td>
<td>5u + 7z + 6u + u + 4z</td>
<td>14</td>
<td>14u + 4z + 9</td>
</tr>
<tr>
<td>G</td>
<td>2z + 8z + 3u + 6z + 4u</td>
<td>30</td>
<td>2u + 3z + 19</td>
</tr>
</tbody>
</table>

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181
Why Does A Sheep Scratch Himself?

SIMPLIFY any expression below. Then EVALUATE for the given value(s) of the variable(s). Find the simplified expression in the answer column. Notice the letter next to it. Write this letter above the value of the expression which you will find at the bottom of the page. Keep working and you will discover the answer to the title question.

1. $3x + 7x + 2$ if $x = 6$
2. $4y + 5 + 2y$ if $y = 3$
3. $9 + x + 4x$ if $x = 8$
4. $8y + 3 + 4y$ if $y = 4$
5. $9x + 5 + x + 8$ if $x = 7$
6. $4y + 8y + 6 + 2y$ if $y = 2$
7. $4x + 2y + 7x + 3$ if $x = 3, y = 4$
8. $8 + 3x + x + 5y$ if $x = 8, y = 5$
9. $9x + 6y + 5x + 4y$ if $x = 7, y = 9$
10. $8 + 6x + 4 + 8y$ if $x = 1, y = 6$
11. $3x + 2y + 4 + 9y$ if $x = 8, y = 4$
12. $4x + 5y + 7x + 5 + 2y$ if $x = 2, y = 3$
13. $9 + 8x + 3y + 3 + 5y$ if $x = 7, y = 5$
14. $x + 6x + 2y + 1 + 9y$ if $x = 6, y = 9$
15. $6x + 2y + 5y + 7 + y$ if $x = 8, y = 1$
16. $8x + 8y + x + 6y + 4x$ if $x = 1, y = 2$
17. $3x + 8 + 4y + 7 + 3x$ if $x = 9, y = 6$
18. $5x + 5y + 9y + 2x + y$ if $x = 8, y = 3$

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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<td>49</td>
<td>108</td>
<td>34</td>
<td>188</td>
<td>51</td>
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</table>
**DIRECTIONS:**
Evaluate any expression below for the given values of the variables. Each time your answer appears in the code, write the letter of that exercise above it.

**KEEP WORKING AND YOU WILL DECODE THE LINE.**

<table>
<thead>
<tr>
<th>M</th>
<th>5x + 4 if x = 3</th>
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<tbody>
<tr>
<td>G</td>
<td>7a + 3 if a = -2</td>
</tr>
<tr>
<td>P</td>
<td>-3y - 9 if y = -8</td>
</tr>
<tr>
<td>A</td>
<td>4b + 9t if b = 7, t = -2</td>
</tr>
<tr>
<td>C</td>
<td>-8g + 3n if g = -3, n = 4</td>
</tr>
<tr>
<td>N</td>
<td>-6s - 5h if s = 9, h = 5</td>
</tr>
<tr>
<td>T</td>
<td>x + 7p if x = -1, p = 8</td>
</tr>
<tr>
<td>U</td>
<td>7q - 2d + 3 if q = -7, d = 1</td>
</tr>
<tr>
<td>S</td>
<td>-c + 5m - 3 if c = -5, m = 2</td>
</tr>
<tr>
<td>X</td>
<td>4x + 6y - 2z if x = -9, y = 2, z = -3</td>
</tr>
<tr>
<td>F</td>
<td>-9y + 5p + 3z if y = 7, p = -4, z = 6</td>
</tr>
<tr>
<td>H</td>
<td>7e - m - 4w if e = 3, m = -8, w = 1</td>
</tr>
<tr>
<td>E</td>
<td>6r + 5d + y if r = -4, d = -3, y = 8</td>
</tr>
<tr>
<td>B</td>
<td>9x - 3y - f if x = 3, y = 1, f = -8</td>
</tr>
<tr>
<td>I</td>
<td>-b - 4x + 7g if b = 2, x = 4, g = 5</td>
</tr>
<tr>
<td>R</td>
<td>-2v + 2h - 8s if v = 9, h = 7, s = -6</td>
</tr>
</tbody>
</table>

**TITLE: RAPID MULTIPLICATION**

44 -48 -79 -79 17 -79 -11 10 44 10 32 32 17 55 -65 10 44 19 17 12 10

25 10 44 -31 44 10 17 12 17 -79 -11 -31 -18 15 -31 44 17 -31 -79 36 -31

PRE-ALGEBRA WITH PIZZAZZ! © Creative Publications 183
What Do Race Car Drivers Like To Do?

Simplify each expression and find your answers at the bottom of the page. Shade out the letter or number above each correct answer. When you finish, the answer to the title question will remain.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1 | -4x + 9x | 2 | 6y - 8y | 3 | -7x + x | 4 | 9y - y | 5 | -5x - 5x | 6 | 3y - 7y | 7 | x - 8x + 7 | 8 | y - 2y - 3 | 9 | 5 + 5x - 4x | 10 | 3y - 6y + 7y - 4y | 11 | -9x - 5 - 8 + x | 12 | 6y - 5y - 6y | 13 | 3x - 8y + 2x - 5 - 5y | 14 | -9x + 3 + 2x - 9y - 8 | 15 | 5 + 6x - 3y + x + 8y | 16 | -4x - 4 + x - 2y + 7x | 17 | 5 - y - 6y - 4x | 18 | x - 3 + 5x + 6y + 8x - 9 | 19 | 9x - 3y + 7 - 4x - y | 20 | x - 3 + 5x + 6y + 8x - 9 | 21 | 4x - 4 - 8y + 8 - 5x + 1 | 22 | 3x - x + 6y - 4y - y | 23 | 2x + 2y - x - y - 7 + 5y | 24 | 6x - 8x - 4y - x + 5y - 2y | 25 | 5 - y - 6y - 4x | 26 | x - 3 + 5x + 6y + 8x - 9 | 27 | 4y - 4 | 28 | 2x + 2y - x - y - 7 + 5y | 29 | 6x - 8x - 4y - x + 5y - 2y | 30 | 5 + 5x - 4x | 31 | 3y - 6y + 7y - 4y | 32 | -9x - 5 - 8 + x | 33 | 6y - 6 | 34 | 4x - 2y + 2x + 2y - 4 | 35 | 10x + 2 | 36 | x + 3y + 2 | 37 | 12x + 6y - 12 | 38 | 12x + 6y - 12 | 39 | 12x + 6y - 12 | 40 | 12x + 6y - 12 | 41 | 12x + 6y - 12 | 42 | 12x + 6y - 12 | 43 | 12x + 6y - 12 | 44 | 12x + 6y - 12 | 45 | 12x + 6y - 12 |

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What Does SANTA Do When It Rains?

TO ANSWER THIS QUESTION:
Simplify each expression below. Circle the letter of each answer. Then rearrange the circled letters in each grid to make a word. Write the words in order in the boxes at the bottom of the page.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$-4x + 9x + 3$</td>
<td><strong>B</strong> $6x$</td>
</tr>
<tr>
<td>2</td>
<td>$5x - (-3x)$</td>
<td><strong>H</strong> $8x$</td>
</tr>
<tr>
<td>3</td>
<td>$-8n - (-2n) - 7$</td>
<td><strong>S</strong> $n + 3$</td>
</tr>
<tr>
<td>4</td>
<td>$6n + (-5n) + 3$</td>
<td><strong>T</strong> $-n - 6$</td>
</tr>
<tr>
<td>5</td>
<td>$-3n + n + 7 + 4n$</td>
<td><strong>U</strong> $-n + 17$</td>
</tr>
<tr>
<td>6</td>
<td>$9 - 6n - (-5n) - (-8)$</td>
<td><strong>N</strong> $14t + 11$</td>
</tr>
<tr>
<td>7</td>
<td>$-8t + (-5) + (-t) + 1$</td>
<td><strong>L</strong> $-9t - 4$</td>
</tr>
<tr>
<td>8</td>
<td>$-2t + 7 - (-t) + 9t$</td>
<td><strong>O</strong> $5t + 7$</td>
</tr>
<tr>
<td>9</td>
<td>$13t + 5 + 9 - (-t)$</td>
<td><strong>E</strong> $8u - 7$</td>
</tr>
<tr>
<td>10</td>
<td>$u + (-10u) + (-4) - (-1)$</td>
<td><strong>S</strong> $4u - 7$</td>
</tr>
<tr>
<td>11</td>
<td>$-6 - 3u + 9 - (-4u)$</td>
<td><strong>H</strong> $u + 3$</td>
</tr>
<tr>
<td>12</td>
<td>$-u - 7 + 8u + (-3u)$</td>
<td><strong>A</strong> $4k - 1$</td>
</tr>
<tr>
<td>13</td>
<td>$4k + 7 + 3k - 8 - 3k$</td>
<td><strong>E</strong> $12k + 3$</td>
</tr>
<tr>
<td>14</td>
<td>$9 + (-2k) + (-4) - 6k + 1$</td>
<td><strong>N</strong> $-8k + 6$</td>
</tr>
<tr>
<td>15</td>
<td>$8k - k + 7 - (-5k) - 8$</td>
<td><strong>A</strong> $4k - 1$</td>
</tr>
<tr>
<td>16</td>
<td>$-4 - 2k - (-4) + (-6k)$</td>
<td><strong>E</strong> $12k + 3$</td>
</tr>
<tr>
<td>17</td>
<td>$-5x - 5 + 3x + (-1) - x$</td>
<td><strong>A</strong> $13x - 8$</td>
</tr>
<tr>
<td>18</td>
<td>$x - (-3) + 8 - 2x - 6$</td>
<td><strong>G</strong> $x - 3$</td>
</tr>
<tr>
<td>19</td>
<td>$4x - 5x + (-3) + 9x - 7x$</td>
<td><strong>E</strong> $-3x - 6$</td>
</tr>
<tr>
<td>20</td>
<td>$-x + 4x - (-8x) - 9 + 2x + 1$</td>
<td></td>
</tr>
</tbody>
</table>

PRE-ALGEBRA WITH PIZZAZZ!
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Who Won The Race Between The Boy Silkworm And The Girl Silkworm?

SIMPLIFY any expression below. Then EVALUATE the result for the given value(s) of the variables. Find the simplified expression in the answer column. Notice the letter next to it. Find the value of the expression at the bottom of the page and write this letter above it. Keep working and you will discover the answer to the title question.

1. $7x + 3 - 2x$ if $x = 8$
2. $10 - 3y - 7$ if $y = 3$
3. $-3x + 8x - 4$ if $x = -2$
4. $7 - (-2y) + y - 9$ if $y = 6$
5. $5x + (-8x) + 3 - x$ if $x = -5$
6. $4y - 4 - (-y) - 9y$ if $y = 4$
7. $-x + 8 + 7x - (-1)$ if $x = -10$
8. $-2 + (-6y) + 5y - 8y$ if $y = -4$
9. $4x + 5 - 5x$ if $x = -12$
10. $4x + 2y - x - 8$ if $x = 1, y = 5$
11. $-3x + 9 - (-4y) + 5x$ if $x = 1, y = -5$
12. $-8 - 4x + y - 6x$ if $x = -3, y = 8$
13. $2x + 5y - 3x + (-8y)$ if $x = -9, y = 9$
14. $7x + 1 - y - 3x - (-9)$ if $x = 7, y = -6$
15. $5x + (-y) + 8 - 6x + 9y$ if $x = 4, y = -2$
16. $7 - x + 4y - 6x - 3y$ if $x = -1, y = 8$
17. $-x - (-y) + (-x) - y + 5$ if $x = -3, y = -6$

\[
\begin{array}{cccccccccccccccccccccccc}
-6 & 17 & 16 & -18 & 23 & 22 & -14 & 34 & -9 & -51 & 30 & 43 & -12 & -20 & 11 & 5 & 44
\end{array}
\]

PRE-ALGEBRA WITH PIZZAZZ!
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How Many Cattle Are There On The Lazy Circle Double-O Bar Four Square Ranch?

Simplify any expression below and find your answer in the corresponding answer column. Write the letter of the exercise in the box that contains the number of the answer. Keep working and you will discover the answer to the title question.

<table>
<thead>
<tr>
<th>1</th>
<th>7(2m + 6) + 8m</th>
<th>25</th>
<th>36m + 54</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3(1 + 4m) + 5m</td>
<td>14</td>
<td>42m + 23</td>
</tr>
<tr>
<td>E</td>
<td>6m + 7(7m + 9)</td>
<td>23</td>
<td>17m + 3</td>
</tr>
<tr>
<td>H</td>
<td>4 + 6(3m + 2)</td>
<td>7</td>
<td>18m + 16</td>
</tr>
<tr>
<td>D</td>
<td>9 + 9(5 + 4m)</td>
<td>18</td>
<td>22m + 42</td>
</tr>
<tr>
<td>I</td>
<td>2 + (6m + 3)7</td>
<td>11</td>
<td>42m + 27</td>
</tr>
<tr>
<td>U</td>
<td>(4m + 3)9 + 6m</td>
<td>2</td>
<td>55m + 63</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>3(x + 6) + 8x</td>
<td>17</td>
<td>13x + 14</td>
</tr>
<tr>
<td>G</td>
<td>5(x + 5) + 9</td>
<td>5</td>
<td>11x + 18</td>
</tr>
<tr>
<td>D</td>
<td>7(2 + x) + 6x</td>
<td>15</td>
<td>16x + 22</td>
</tr>
<tr>
<td>E</td>
<td>x + 5(5x + 1)</td>
<td>4</td>
<td>5x + 49</td>
</tr>
<tr>
<td>V</td>
<td>4 + (8x + 9)2</td>
<td>28</td>
<td>5x + 34</td>
</tr>
<tr>
<td>I</td>
<td>x + (4 + 3)x7</td>
<td>20</td>
<td>26x + 5</td>
</tr>
<tr>
<td>O</td>
<td>5(8 + x) + 9</td>
<td>26</td>
<td>22x + 28</td>
</tr>
</tbody>
</table>

| H   | 3 + 5t + 1 + 8t | 6  | 16t + 51  |
| E   | 6t + 3(2t + 9t) | 12 | 9t + 43   |
| T   | 4t + 9 + (2t + 7t) | 8  | 33t + 13  |
| N   | 8t + (7 + 3t)4 + 2t | 21 | 9t + 14   |
| F   | 7t + 9 + 5 + t  | 19 | 33t + 8   |
| B   | 9 + 5(t + 1) + 4t | 10 | 8t + 68   |
| R   | t + 3 + 8(5 + t) | 27 | 22t + 28  |

<p>| F   | 5(9k + 2) + 8(3 + 4k) | 17 | 13x + 14 |
| G   | (3k + 4)6 + 7(k + 6) | 5  | 11x + 18 |
| D   | 9(7 + k) + (6k + 3)2 | 15 | 16x + 22 |
| E   | (9k + 1)6 + (4 + 2k)9 | 4  | 5x + 49  |
| V   | 7(7 + 8k) + 3(k + 5) | 28 | 5x + 34  |
| I   | 4(2 + 4k) + (7k + 1)8 | 20 | 26x + 5  |
| O   | 4(2k + 6) + 8(3 + 3k) | 26 | 22x + 28 |</p>
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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<tbody>
<tr>
<td>I</td>
<td>J</td>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
<td>O</td>
<td>P</td>
</tr>
<tr>
<td>Q</td>
<td>R</td>
<td>S</td>
<td>T</td>
<td>U</td>
<td>V</td>
<td>W</td>
<td>X</td>
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<table>
<thead>
<tr>
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<th>Answer</th>
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<tr>
<td>−7x + 12</td>
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</tr>
<tr>
<td>25x − 30</td>
<td>FOOTBALL</td>
</tr>
<tr>
<td>x − 18</td>
<td>COULD</td>
</tr>
<tr>
<td>33x − 14</td>
<td>THE</td>
</tr>
<tr>
<td>44a + 16</td>
<td>AS</td>
</tr>
<tr>
<td>15x + 28</td>
<td>HIS</td>
</tr>
<tr>
<td>13a − 27</td>
<td>TO</td>
</tr>
<tr>
<td>25n − 88</td>
<td>SO</td>
</tr>
<tr>
<td>44a − 13</td>
<td>FUMBLE</td>
</tr>
<tr>
<td>40a + 37</td>
<td>BALL</td>
</tr>
<tr>
<td>5n − 24</td>
<td>WHO</td>
</tr>
<tr>
<td>−48n − 16</td>
<td>FLOOD</td>
</tr>
<tr>
<td>40a + 5</td>
<td>PLAYER</td>
</tr>
<tr>
<td>−48n − 88</td>
<td>UNDER</td>
</tr>
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</table>

DIRECTIONS: Simplify any expression below. Find your answer in one of the answer columns and notice the word next to it. Write the word in the box above that has the same letter as that exercise.

KEEP WORKING AND YOU WILL HEAR ABOUT SOMETHING ALL WET!

<table>
<thead>
<tr>
<th>Expression</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 5x − 7(2 − 4x)</td>
<td>M 4x − 7(3 − 3x) − 9</td>
</tr>
<tr>
<td>B 8 − 3(6 − 6x)</td>
<td>N −8 + 6(−x − 3) + 4x</td>
</tr>
<tr>
<td>C 9a − 4(2a + 5)</td>
<td>O −2a + 7 − 3(−9 − 4a)</td>
</tr>
<tr>
<td>D −3 − 8(−5a − 1)</td>
<td>P −1 + 5a − 9(−2 + 5a)</td>
</tr>
<tr>
<td>E −7n + 4(−6 + 3n)</td>
<td>Q 9(3n − 9) − 7 − 2n</td>
</tr>
<tr>
<td>F −8(2n − 4) + 5</td>
<td>R −4(5 + n) + n + 6</td>
</tr>
<tr>
<td>G 2(x + 6) − 9x</td>
<td>S −6x − 2(−5x + 9) − 3x</td>
</tr>
<tr>
<td>H −5(−7 − 3x) − 7</td>
<td>T 5 − 8(1 − x) − 9x</td>
</tr>
<tr>
<td>I 4(−2a + 6) + a</td>
<td>U −a + 7 + 5(−4 + 7a)</td>
</tr>
<tr>
<td>J 4a − 9(3 − a)</td>
<td>V −6(−6a − 3) − 2 + 8a</td>
</tr>
<tr>
<td>K −8 − 8(6n + 1)</td>
<td>W 4n − 5n + 3(n + 4)</td>
</tr>
<tr>
<td>L −5(−7 + n) − 7n</td>
<td>X 7 + 9(−2n + 9) + 1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Expression</th>
<th>Answer</th>
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<tbody>
<tr>
<td>a − 24</td>
<td>HIKE</td>
</tr>
<tr>
<td>a − 20</td>
<td>FOOTBALL</td>
</tr>
<tr>
<td>−7a + 24</td>
<td>COACH</td>
</tr>
<tr>
<td>2n + 12</td>
<td>A</td>
</tr>
<tr>
<td>−40a + 17</td>
<td>WATER</td>
</tr>
<tr>
<td>−12n + 35</td>
<td>THE</td>
</tr>
<tr>
<td>−3n − 14</td>
<td>HE</td>
</tr>
<tr>
<td>18x − 10</td>
<td>ROOKIE</td>
</tr>
<tr>
<td>10a + 34</td>
<td>WITH</td>
</tr>
<tr>
<td>x − 3</td>
<td>GO</td>
</tr>
<tr>
<td>−16n + 37</td>
<td>KEPT</td>
</tr>
<tr>
<td>34a − 13</td>
<td>IN</td>
</tr>
<tr>
<td>−18n + 89</td>
<td>SUB</td>
</tr>
<tr>
<td>−2x − 26</td>
<td>FIELD</td>
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</tbody>
</table>
DAFFYNITION DECORDER

TO DECODE THESE THREE DAFFYNITIONS, FOLLOW THESE DIRECTIONS:

Simplify any expression below. Then evaluate the expression for the given value of the variable. Each time your answer appears in the code, write the letter of that exercise above it.

KEEP WORKING AND YOU WILL DECODE THESE THREE DEFT-NITIONS.

LAZY BUTCHER:

-49 121 12 6 14 -114 12 -12 121 -79

RUBBER RAFT:

48 14 12 41 -20 -28 -114 41

CORN SALESMAN:

10 6 12 14 -61 -20 -79 -114 -61 121 -79

1 6(3x - 5) - 9x if x = 4
U 4 - 8(-2 - 6t) if t = -1
Y -3s + 2(-5s +1) if s = -3
R -7(x + 6) + 12 if x = 7
F 4(8+5u)+2u if u = -2
S -5 - 3(4 - r) if r = 9
E 7 - 6(-8 + 2n) + n if n = -6

P 8x - 9x + 2(-3x - 4) if x = -8
K -4(4 + 7y) + 5 + 3y if y = 2
B 5(-m - 3) + 4m - 10 if m = -5
M -1 + 9(4d - 2) - 6d if d = -1
A 6 - 2y - 6(-3y + 7) if y = 3
O -8(9 + 2k) + 8k + k if k = 6
L -w - 5 + 5(-5w + 9) if w = 1
What Happened To The Owl Who Swallowed A Watch?

TO ANSWER THIS QUESTION:
Simplify each expression below. Draw a straight line connecting each expression with its simplified form. Each line will cross a number and a letter. The number tells you where to put the letter in the row of boxes at the bottom of the page.

\[-5x - (7x + 2)\]  \(\boxed{3}\)
\[4 - (9x - 3)\]  \(\boxed{1}\)
\[-8x - (-2x + 4)\]  \(\boxed{6}\)
\[-(5 + 6x) + 8\]  \(\boxed{R}\)
\[-4(-9 + x) + 5x\]  \(\boxed{L}\)
\[6x - (3x - 7) + 1\]  \(\boxed{9}\)
\[-9 + (2 - x) + 8x\]  \(\boxed{R}\)
\[(2x - 6) - (-9x - 1)\]  \(\boxed{6}\)
\[-(5x + 8) + 3 + 4x\]  \(\boxed{R}\)
\[7x - (-6 - 2x) - x\]  \(\boxed{E}\)
\[-9 + x + 3(-8 + 5x)\]  \(\boxed{K}\)
\[-(6x - 6) + (4x - 8)\]  \(\boxed{K}\)
\[(3x + 1) - (-3x - 7) - 9x\]  \(\boxed{12}\)
\[-5 + (4 - 2x) - 8x + 5\]  \(\boxed{12}\)
\[-(-8x - 4) + x - 7 - 3x\]  \(\boxed{12}\)
\[(4 - 6x) - (-4x + 5) - 6x\]  \(\boxed{12}\)
\[9x + 9 + 2x - 7(3 + x)\]  \(\boxed{12}\)
\[-1 - (3x + 2) - 7x + 8\]  \(\boxed{12}\)

\[-6x + 3\]  \(\boxed{3}\)
\[-x - 5\]  \(\boxed{9}\)
\[-2x - 2\]  \(\boxed{9}\)
\[6x - 3\]  \(\boxed{9}\)
\[-12x - 2\]  \(\boxed{9}\)
\[8x + 6\]  \(\boxed{9}\)
\[4x - 12\]  \(\boxed{9}\)
\[-9x + 7\]  \(\boxed{9}\)
\[x + 36\]  \(\boxed{9}\)
\[7x - 7\]  \(\boxed{9}\)
\[-8x - 1\]  \(\boxed{9}\)
\[-6x - 4\]  \(\boxed{9}\)
\[16x - 33\]  \(\boxed{9}\)
\[-10x + 4\]  \(\boxed{9}\)
\[3x + 8\]  \(\boxed{9}\)
\[-4x + 5\]  \(\boxed{9}\)
\[11x - 5\]  \(\boxed{9}\)
\[-3x + 8\]  \(\boxed{9}\)
Why Did the Carpet Installer Quit His Job?

Simplify any expression below. Find your answer in the answer column and notice the letter next to it. Write the letter in each box at the bottom of the page that contains the number of that exercise.

KEEP WORKING AND YOU WILL DISCOVER THE ANSWER TO THE TITLE QUESTION!

1. \(6x^2 - 2x + 5x - 3\)
2. \(5 - 7x^2 + 3x + 4x^2\)
3. \(9x^2 + 2x + 5 - 5x^2 + 8x - 6\)
4. \(-4x - 4 + 6x^2 + x - 9x^2 - 8\)
5. \(-5x^2 + 6 + x^2 - 1 + 5x^2\)
6. \(-3 + 8x^2 - x + 8 + 7x^2 + 2x\)
7. \(4x - 3x^2 + 9x + 4x^2 - 6x\)
8. \(-2x^2 - 9 - 3x - 2x^2 + 8x + 7\)
9. \(3x^3 + 7x^2 - 9x - x^3 + 3x^2 + 6x\)
10. \(-9x^3 - x^2 + 5x - 4 - 2x^3 + 8x^2 - 6x + 6\)
11. \(3 - 4x - 7x^2 + 4x^3 - 2 - 8x - 7x^2 - x^3\)
12. \(-4x^3 + 3x^2 - 5x - 7x^3 - 3x^2 + 2x - 9\)
13. \(6x - 7 + 8x^3 - 4x - 6x^3 - 1 - 8x + 5\)
14. \(-7x^2 - 4x - 7 + x^2 - 5x^2 + x^3 + 8x - 2x^3\)
15. \(6x^2 + 2x^4 - 9x^3 - 6x^2 + 2 - 5x^4 + x^3 - x\)
16. \(-3 - 3x^4 + 2x^2 - 1 + 7x^4 + x^3 - 6x^2 - 2x^4\)
17. \(-5x^4 - x^2 + 8x^3 + 4x + 2x^4 - x^3 + x^2\)

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</table>

PRE-ALGEBRA WITH PIZZAZZ!
© Creative Publications 191
Why Is A Lame Elephant Like Adding 19 And 4?

Find the simplest form for any expression below in the corresponding answer column. (Some of the expressions cannot be simplified.) The letter of the exercise goes in the box that contains the number of the answer. Keep working and you will get the answer to the title question.

<table>
<thead>
<tr>
<th>T</th>
<th>$x^2 \cdot x^4$</th>
<th>R</th>
<th>$2x^7$</th>
<th>W</th>
<th>$(4n^3t^2)(3n^2t^4)$</th>
<th>28</th>
<th>$8n^5t^3$</th>
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<tr>
<td>E</td>
<td>$x^3 \cdot x^7$</td>
<td>2</td>
<td>$x^2 + x^5$</td>
<td>D</td>
<td>$(-2n^2t^5)(4nt)$</td>
<td>9</td>
<td>$12n^5t^6$</td>
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<tr>
<td>S</td>
<td>$x^2 \cdot x$</td>
<td>11</td>
<td>$x^6$</td>
<td>H</td>
<td>$(2n^4t^2)(nt^2)$</td>
<td>21</td>
<td>$-8n^2t^4$</td>
</tr>
<tr>
<td>O</td>
<td>$2x^4 \cdot x^3$</td>
<td>20</td>
<td>$6x^3$</td>
<td>E</td>
<td>$(-n^3t)(-8n^2t^2)$</td>
<td>10</td>
<td>$-12n^7t^4$</td>
</tr>
<tr>
<td>A</td>
<td>$3x^2 \cdot 2x$</td>
<td>25</td>
<td>$x^3$</td>
<td>T</td>
<td>$(t^2)(2nt)$</td>
<td>5</td>
<td>$2nt^3$</td>
</tr>
<tr>
<td>N</td>
<td>$x^2 \cdot y^3$</td>
<td>17</td>
<td>$x^2y^3$</td>
<td>N</td>
<td>$(4n^6t)(-3nt^3)$</td>
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<td>$-8n^3t^6$</td>
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<tr>
<td>E</td>
<td>$x^2 + x^5$</td>
<td>15</td>
<td>$x^{10}$</td>
<td>R</td>
<td>$(-n^2t)(8t^3)$</td>
<td>12</td>
<td>$2n^5t^4$</td>
</tr>
<tr>
<td>U</td>
<td>$(3v^2)(4v^5)$</td>
<td>26</td>
<td>$-10v^5$</td>
<td>E</td>
<td>$a^4 \cdot a^6$</td>
<td>19</td>
<td>$6a^2b^4$</td>
</tr>
<tr>
<td>O</td>
<td>$(-2v^3)(5v^2)$</td>
<td>16</td>
<td>$18v^2$</td>
<td>N</td>
<td>$a^4 \cdot b^6$</td>
<td>27</td>
<td>$a^4b^6$</td>
</tr>
<tr>
<td>S</td>
<td>$(9v^4)(-2v)$</td>
<td>24</td>
<td>$2v^2 + 7v$</td>
<td>D</td>
<td>$a^4 + a^6$</td>
<td>23</td>
<td>$-6a^3b^3$</td>
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<tr>
<td>A</td>
<td>$(-6v)(-3v)$</td>
<td>6</td>
<td>$-18v^5$</td>
<td>1</td>
<td>$(-3ab^2)(2a^2b)$</td>
<td>14</td>
<td>$a^{10}$</td>
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<tr>
<td>R</td>
<td>$(2v^2)(7v)$</td>
<td>4</td>
<td>$12v^7$</td>
<td>P</td>
<td>$(3b)(-2ab^3)$</td>
<td>7</td>
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<tr>
<td>E</td>
<td>$2v^2 + 7v$</td>
<td>1</td>
<td>$14v^2k$</td>
<td>R</td>
<td>$(-6a^2)(-b)$</td>
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<td>$-6ab^4$</td>
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<tr>
<td>H</td>
<td>$(2v^2)(7k)$</td>
<td>22</td>
<td>$14v^3$</td>
<td>C</td>
<td>$(2a^2b)(3b^3)$</td>
<td>13</td>
<td>$6a^2b$</td>
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</table>
**FIND A MATCH**

Solve any equation in the top block and find the solution in the bottom block. Transfer the word from the top box to the corresponding bottom box. Keep working and you will get another joke.

<table>
<thead>
<tr>
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<td>((3u^2)^3)</td>
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<td>((-3uk)^5)</td>
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<td>((-2u^2k)^3)</td>
<td>((-2u^4)^3)</td>
<td>((2u^2)^4)</td>
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<td>((u_2)^3)</td>
<td>((-u_2)^3)</td>
</tr>
</tbody>
</table>
Double Cross

1. What Do You Get When You Cross Two Bowling Pins With a Lollipop?

   ANSWER:
   \[-69 \quad -13 \quad 133 \quad 97 \quad -20 \quad -29 \quad 158 \quad 10 \quad -99 \quad -39 \quad -13 \quad 133 \quad 158\]

2. What Do You Get When You Cross A Centipede With A Parrot?

   ANSWER:
   \[-69 \quad -66 \quad -69 \quad -13 \quad -20 \quad 133 \quad -29 \quad 158 \quad -69 \quad -13 \quad -20 \quad 133 \quad -29\]

3. What Do You Get When You Cross A Gangster With A Garbage Man?

   ANSWER:
   \[16 \quad -19 \quad 21 \quad -69 \quad -10 \quad 133 \quad -18 \quad -29 \quad 18 \quad 21 \quad -19 \quad 133 \quad 160 \quad -29\]

Simplify any expression below (if it can be simplified). Then evaluate the expression for the given value of the variable. Each time your answer appears in the code, write the letter of that exercise above it. Keep working and you will discover the result of each double cross!

Remember: FIRST simplify, THEN evaluate.

\[\begin{align*}
\text{C} & \quad 4y^2 - 3 \text{ if } y = 5 \\
\text{N} & \quad -2u^2 + 8 \text{ if } u = 3 \\
\text{E} & \quad -7m^2 - 1 \text{ if } m = -2 \\
\text{D} & \quad 3x^2 + 4x - 2 \text{ if } x = 2 \\
\text{S} & \quad -5x^2 + 7x + 9 \text{ if } x = -4 \\
\text{A} & \quad -2r^2 - 5r - 6 \text{ if } r = -7 \\
\text{Y} & \quad x^2 - 8x + 1 \text{ if } x = 9 \\
\text{Z} & \quad -9n^2 + 2n - 7 \text{ if } n = -1 \\
\text{T} & \quad 6t^2 - t + 3 \text{ if } t = -5 \\
\text{M} & \quad 2x^2 - 3x + 8x - 8 \text{ if } x = 8 \\
\text{G} & \quad 9 - p^2 + 5p + 4p^2 \text{ if } p = -3 \\
\text{P} & \quad -3m^2 - 8 + 4m + 1 \text{ if } m = 4 \\
\text{O} & \quad -5v + 5v^2 - v - 2 + 7v^2 \text{ if } v = -1 \\
\text{R} & \quad 1 - y^2 - 4y^2 - 3y + 6 \text{ if } y = 2 \\
\text{W} & \quad 8x^2 - 2 - 9x^2 \text{ if } x = -8 \\
\text{K} & \quad -2h^2 - 5h + h^2 + 4 + 3h \text{ if } h = -6 \\
\text{I} & \quad -8 + 3x - 3x^2 + 6 + 5x^2 \text{ if } x = -9 \\
\text{L} & \quad 4y - 2y^2 + 1 - 4y - 12 \text{ if } y = 1
\end{align*}\]
What Did The Skunk Say When The Wind Changed?

TO ANSWER THIS IMPORTANT QUESTION:
Evaluate any expression below for the given values of the variables (see table). Find your answer at the bottom of the page. Write the letter of that exercise in ANY ONE of the boxes directly under the answer.

When you finish all the exercises, rearrange the letters in each group to make a word. Write the words in order in the BOTTOM row of boxes.

VALUES OF THE VARIABLES
x = 2, y = 1, z = 4, a = -3, b = -8, c = 6

S \( \frac{xa}{c} = \)

O \( \frac{2a^2}{x} = \)

I \( \frac{(2a)^2}{x} = \)

C \( \frac{(2a)^2}{2a^2} = \)

T \( \frac{c^2y^2}{z} = \)

E \( \frac{-5x^2}{y+c} = \)

O \( \frac{b-a}{a-b} = \)

O \( \frac{3y^2}{z+a} = \)

A \( \frac{-8y^2}{b+z} = \)

L \( \frac{x^2+c^2}{b} = \)

K \( \frac{y^2-a^2}{y+a} = \)

E \( \frac{-x^2}{z} = \)

T \( \frac{-4a^2}{c+b} = \)

N \( \frac{a^2-c^2}{3a} = \)

A \( \frac{z^2+b^2}{2b} = \)

L \( \frac{z^2}{2b} + \frac{b^2}{2b} = \)

C \( \frac{(z+b)^2}{2b} = \)

W \( \frac{3a^2+7a}{x} = \)

M \( \frac{(x-c)^2}{x-c} = \)

B \( \frac{y^2b}{yx^2} = \)

M \( \frac{c-a}{a-c} = \)

18 -5 -1 2 9 -4 3

REARRANGE EACH GROUP OF LETTERS TO MAKE A WORD
What Did Ignatz Say About Her Brain Surgeon?

Do any exercise below. Find your answer in the answer column and notice the letter next to it. Each time the exercise number appears in the code, write this letter above it. Keep working and you will answer the question.

\[ d = rt \] where \( d \) is the distance traveled by an object moving at speed \( r \) in time \( t \). Find \( d \) if:

1. \( r = 40, \ t = 8 \)
2. \( r = 55, \ t = 4 \)

\[ I = prt \] where \( I \) is the interest on an amount \( p \), borrowed (or invested) at interest rate \( r \) for time \( t \). Find \( I \) if:

3. \( p = 1000, \ r = 0.06, \ t = 1 \)
4. \( p = 500, \ r = 0.14, \ t = 3 \)

\[ P = 2l + 2w \] where \( P \) is the perimeter of a rectangle with length \( l \) and width \( w \). Find \( P \) if:

5. \( l = 7, \ w = 3 \)
6. \( l = 12, \ w = 3.5 \)

\[ d = \frac{1}{2} n (n - 3) \] where \( d \) is the number of diagonals of a polygon with \( n \) sides. Find \( d \) if:

7. \( n = 6 \)
8. \( n = 20 \)

\[ A = \frac{1}{2} a (b_1 + b_2) \] where \( A \) is the area of a trapezoid with altitude of length \( a \), and bases of lengths \( b_1 \) and \( b_2 \). Find \( A \) if:

9. \( a = 4, \ b_1 = 9, \ b_2 = 7 \)
10. \( a = 3, \ b_1 = 7.5, \ b_2 = 2.5 \)

\[ s = 16t^2 \] where \( s \) is the distance (feet) a free-falling object travels in time \( t \) (seconds). Find \( s \) if:

11. \( t = 3 \)
12. \( t = 20 \)

\[ w = 0.03e^3 \] where \( w \) is the approximate weight (pounds) of an ice cube with edge of length \( e \) (inches). Find \( w \) if:

13. \( e = 2 \)
14. \( e = 8 \)

\[ d = s + 0.05s^2 \] where \( d \) is the approximate braking distance (feet) on dry pavement of a car traveling at speed \( s \) (miles per hour). Find \( d \) if:

15. \( s = 30 \)
16. \( s = 60 \)

15-9-2-12-8-8-4-13-12-7-2-1-15-16-12-14-15-2-10-2-3-6-16-4-16-15-5-11
**Get The Message**

<p>| | | |</p>
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<td>1</td>
<td>(2x + 7 = 17)</td>
<td>{5} W F</td>
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<tr>
<td>2</td>
<td>(9 + 6s = 57)</td>
<td>{8} H A</td>
</tr>
<tr>
<td>3</td>
<td>(8m - 3 = 19)</td>
<td>{3} E R</td>
</tr>
<tr>
<td>4</td>
<td>(35 = 7t - 8)</td>
<td>{6} A W</td>
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<td>(9u + 3 &lt; 24)</td>
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<td>6</td>
<td>(14 &gt; 20 - 3y)</td>
<td>{4} S I</td>
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<td>7</td>
<td>(17 + 8x \geq 75)</td>
<td>{7} P A</td>
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<td>8</td>
<td>(65 = 4w + 29)</td>
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<td>9</td>
<td>(50 - 3x = 16)</td>
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<td>10</td>
<td>(63 \leq 3 + 6n)</td>
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<td>(63 &lt; 3 + 6n)</td>
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<td>12</td>
<td>(5p - 15 \geq 60)</td>
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<td>(8d + 1 = 5d + 10)</td>
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<td>(4y - 7 = y + 17)</td>
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<td>15</td>
<td>(9h = 20 + 6h)</td>
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<td>{5} M I</td>
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<td>(15e - 7 = 6 + 2e)</td>
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<td>(3x + 39 \geq 5x - 1)</td>
<td>{20} T U</td>
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<tr>
<td>20</td>
<td>(3v + 39 &gt; 5v - 1)</td>
<td>{20} H M</td>
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<td>21</td>
<td>(57 - 3g = 93 - 7g)</td>
<td>{9} H I</td>
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<tr>
<td>22</td>
<td>(8 + 6x \leq 9x - 30)</td>
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<tr>
<td>24</td>
<td>(6m &lt; 7m - 1)</td>
<td>{1} L D</td>
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</table>

**DIRECTIONS:**

For each exercise, determine whether or not the number in braces is a solution of the given open sentence. Circle the letter in the appropriate column next to each exercise.

When you finish, print the circled letters in the row of boxes at the bottom of the page. FIRST print those from the column marked "Yes," THEN print those from the column marked "No."

*A MESSAGE WILL APPEAR.*
How Do You Buy Something In Mexico?

For any sentence below, circle the member of the given replacement set that is the solution. Find your answer in the code key and notice the letter next to it. Print this letter in the box at the bottom of the page that contains the number of that exercise. Keep working and you will discover the answer to the title question.

1. \[3y + 9 = 15\] \(\{4, 2, -2\}\)  
2. \[7 + 4x = -1\] \(\{3, -3, -2\}\)  
3. \[26 - 8t = -30\] \(\{5, 7, 8\}\)  
4. \[11 = 6x - 13\] \(\{4, -2, 1\}\)  
5. \[-7n + 5 = 12\] \(\{9, -3, -1\}\)  
6. \[16 - 4x = 24\] \(\{2, -2, 7\}\)  
7. \[-75 = -25 + 5d\] \(\{5, -10, 10\}\)  
8. \[-8 = -2y - 18\] \(\{4, -4, -5\}\)  
9. \[9u - 16 = 20\] \(\{4, 3, 2\}\)  
10. \[-12 = 12r + 24\] \(\{-1, -2, -3\}\)  
11. \[52 + 21p = 10\] \(\{-1, -2, 2\}\)
Why Are Poets Poor?

Cross out each box that contains the solution to one of the equations. When you finish, there will be 7 boxes not crossed out. Print the letters from these boxes in the boxes at the bottom of the page. You will have the answer to the title question!

1. \( \frac{x}{2} = 7 \)
2. \( \frac{k}{3} = -4 \)
3. \( \frac{1}{2} y = 14 \)
4. \( \frac{1}{4} m = -10 \)
5. \( \frac{-1}{8} p = 3 \)
6. \( \frac{-1}{5} q = -9 \)
7. \( \frac{-v}{3} = 13 \)
8. \( \frac{n}{7} = 8 \)
9. \( 21 = \frac{w}{2} \)
10. \( -18 = \frac{x}{4} \)
11. \( 5 = \frac{1}{12} y \)
12. \( -25 = \frac{-1}{8} t \)
13. \( \frac{-k}{6} = 33 \)
14. \( -1 = \frac{r}{50} \)
15. \( \frac{1}{9} y = 20 \)
16. \( -3 = \frac{-1}{18} n \)
17. \( \frac{-1}{5} x = 11 \)
18. \( 12 = \frac{v}{12} \)
19. \( \frac{1}{3} m = -3 \)
20. \( -19 = \frac{-1}{2} d \)
21. \( \frac{x}{24} = 4 \)

<table>
<thead>
<tr>
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<th>PO</th>
<th>VE</th>
<th>RS</th>
<th>ET</th>
<th>RH</th>
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<th>RY</th>
<th>TO</th>
<th>YM</th>
<th>ON</th>
<th>EY</th>
<th>ES</th>
<th>ED</th>
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</thead>
<tbody>
<tr>
<td>50</td>
<td>38</td>
<td>60</td>
<td>56</td>
<td>-9</td>
<td>91</td>
<td>45</td>
<td>-12</td>
<td>72</td>
<td>-2</td>
<td>24</td>
<td>180</td>
<td>144</td>
<td>90</td>
</tr>
<tr>
<td>OE</td>
<td>MA</td>
<td>KE</td>
<td>SN</td>
<td>AR</td>
<td>OU</td>
<td>IN</td>
<td>CH</td>
<td>TP</td>
<td>IT</td>
<td>CA</td>
<td>PL</td>
<td>AY</td>
<td>SH</td>
</tr>
<tr>
<td>82</td>
<td>198</td>
<td>42</td>
<td>-4</td>
<td>14</td>
<td>200</td>
<td>28</td>
<td>74</td>
<td>-39</td>
<td>54</td>
<td>96</td>
<td>69</td>
<td>-55</td>
<td></td>
</tr>
</tbody>
</table>
What Are The Titles Of These Pictures?

Solve any equation below and find the solution in the coded title above that column of exercises. Each time the solution appears, write the letter of the exercise above it. Keep working and you will decode each title.

-2   -6   -21  -3   5   4   -11  -3

9   -8   -3   14   -2   4   -21

-2   7   -11  -8   -3   7   -11  7   -21  1   -8

O 6x = 24
A 9k = 63
D 28 = 2n
I -5y = 30
S -8q = 64
E -21 = 7m
O 18v = 18
U -3x = 27
P -60 = -12t
R -2p = 42
L -x = 11
F -30 = 15y

-30 -17 -13 -17 12 11 -30 -7

25 -15 -4 -4 11 -30 6 11 24

-15 6 24 -13 -17 6 -30 -13 25 2

I 4r = 44
M -16v = -32
A 5x = -75
O 39 = -3w
E 7t = -49
N -x = -24
H 72 = 6m
R -100 = -4z
W -10k = 170
B 8n = -32
T 30 = -y
S -54 = -9q
1. What Did the Sardine Say When a Submarine Went By?

-56 36 36 -33 -35 -12 -12 7 -35 -12 -96 -35 130 36 31 39 9 36 39 -56 9

2. What Happened to the Grocer Who Stacked All the Liquid Detergents on a High Shelf?

7 9 -6 -35 5 25 -24 -15 39 -8 130 28 31 36 100 25 36 -69

TO DECODE THE ANSWERS TO THESE QUESTIONS:
Solve any equation below and find the solution in the code. Each time it appears, write the letter of the exercise above it. Keep working and you will decode the two answers.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>n + 12 = 4</td>
</tr>
<tr>
<td>B</td>
<td>4x = 36</td>
</tr>
<tr>
<td>C</td>
<td>( \frac{v}{3} = -11 )</td>
</tr>
<tr>
<td>D</td>
<td>w - 9 = 22</td>
</tr>
<tr>
<td>E</td>
<td>-7t = 42</td>
</tr>
<tr>
<td>F</td>
<td>( -\frac{1}{5} y = -20 )</td>
</tr>
<tr>
<td>G</td>
<td>-32 = x + (-20)</td>
</tr>
<tr>
<td>H</td>
<td>-48 = 2q</td>
</tr>
<tr>
<td>I</td>
<td>13 = ( \frac{n}{10} )</td>
</tr>
<tr>
<td>J</td>
<td>-50 = 19 + p</td>
</tr>
<tr>
<td>K</td>
<td>-15r = -75</td>
</tr>
<tr>
<td>L</td>
<td>14 = ( \frac{-u}{4} )</td>
</tr>
<tr>
<td>M</td>
<td>x - (-16) = 44</td>
</tr>
<tr>
<td>N</td>
<td>42 = 6d</td>
</tr>
<tr>
<td>O</td>
<td>( \frac{1}{8} y = -12 )</td>
</tr>
<tr>
<td>P</td>
<td>-4 = 11 + m</td>
</tr>
<tr>
<td>Q</td>
<td>-x = 35</td>
</tr>
<tr>
<td>R</td>
<td>-3 = ( \frac{-a}{13} )</td>
</tr>
<tr>
<td>S</td>
<td>-18 + z = 18</td>
</tr>
<tr>
<td>T</td>
<td>-125 = -5k</td>
</tr>
</tbody>
</table>
## Did You Hear About…

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>J</td>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
<td>O</td>
<td>P</td>
</tr>
<tr>
<td>Q</td>
<td>R</td>
<td>S</td>
<td>T</td>
<td>U</td>
<td>V</td>
<td>W</td>
<td>X</td>
</tr>
</tbody>
</table>

DIRECTIONS: Solve any equation below. Find the solution in one of the answer columns and notice the word next to it. Write the word in the box above that has the same letter as that exercise.

KEEP WORKING AND YOU WILL HEAR ABOUT A BRIGHT DISCOVERY!

### Equations

- **A** \( 7x = 91 \)
- **B** \( 15n = -30 \)
- **C** \( 3y = 42 \)
- **D** \( -9t = 36 \)
- **E** \( -12s = -120 \)
- **F** \( 6m = -42 \)
- **G** \( \frac{1}{2}x = 13 \)
- **H** \( x = -2 \)
- **I** \( \frac{-1}{3}x = -15 \)
- **J** \( \frac{3}{4}y = 6 \)
- **K** \( \frac{-2}{3}v = 14 \)
- **L** \( \frac{-9}{8}y = -27 \)
- **M** \( -8k = 248 \)
- **N** \( \frac{3}{10}m = 15 \)
- **O** \( -11t = -132 \)
- **P** \( \frac{-5}{3}x = 20 \)
- **Q** \( 15x = -225 \)
- **R** \( \frac{-3}{2}u = -3 \)
- **S** \( 48 = 16x \)
- **T** \( -45 = \frac{9}{5}x \)
- **U** \( 360 = -18n \)
- **V** \( -3z = 72 \)
- **W** \( 15 = \frac{5}{6}x \)
- **X** \( \frac{-12}{7}y = -36 \)

### Words

- **10** - STUDENT
- **12** - THE
- **14** - YOUNG
- **2** - GOES
- **15** - SUN
- **24** - TO
- **25** - IT
- **31** - FIGURE
- **45** - ALL
- **5** - MOON
- **2** - CURIOUS

### Additional Words

- **10** - STUDENT
- **20** - FINALLY
- **12** - THE
- **24** - TO
- **14** - YOUNG
- **2** - GOES
- **15** - SUN
- **50** - OUT
- **21** - HIM
- **-4** - SCIENCE
- **-10** - UP
- **-19** - HIT
- **-24** - DAWNED
- **-22** - BRIGHT
Never Say Die!

YOU MAY HAVE HEARD THAT OLD MATH TEACHERS NEVER DIE; THEY JUST REDUCE TO LOWEST TERMS. TO FIND OUT WHAT HAPPENS TO SOME OTHER OLD FOLKS, FOLLOW THESE DIRECTIONS:

The missing words in each sentence are written in code. Solve any equation below and find the solution in the code. Each time it appears, write the letter of that exercise above it. Keep working and you will discover the words to complete each sentence.

Old
\[
\begin{align*}
\frac{-4}{9} & \quad 6 \frac{2}{3} & \quad 7 \frac{1}{5} & \quad \frac{-1}{15} & \quad \frac{-4}{9} & \quad \frac{2}{5} & \quad 3 \frac{1}{3} \\
\end{align*}
\]

Never Die, They Just
\[
\begin{align*}
\frac{-1}{15} & \quad \frac{-4}{3} & \quad \frac{-4}{2} & \quad \frac{3}{5} & \quad \frac{13}{4} & \quad \frac{2}{5} & \quad \frac{7}{15} & \quad \frac{-8}{6} & \quad \frac{7}{5} & \quad \frac{-10}{7}
\end{align*}
\]

Old
\[
\begin{align*}
1 \frac{5}{7} & \quad 1 \frac{3}{4} & \quad \frac{2}{5} & \quad \frac{-4}{9} & \quad \frac{7}{5} & \quad -4 \frac{3}{5} & \quad -4
\end{align*}
\]

Never Die, They Just
\[
\begin{align*}
\frac{-3}{4} & \quad \frac{6}{2} & \quad \frac{7}{5} & \quad \frac{-1}{15} & \quad \frac{3}{5} & \quad \frac{-4}{13} & \quad \frac{-8}{2} & \quad \frac{3}{5} & \quad \frac{6}{2} & \quad \frac{15}{7} & \quad \frac{3}{5}
\end{align*}
\]

Old
\[
\begin{align*}
1 \frac{5}{6} & \quad -5 \frac{5}{7} & \quad -8 & \quad -20 & \quad \frac{-1}{15} & \quad \frac{6}{2} & \quad -8 & \quad -4
\end{align*}
\]

Never Die, They Just
\[
\begin{align*}
\frac{-4}{5} & \quad \frac{3}{5} & \quad \frac{2}{5} & \quad \frac{6}{2} & \quad \frac{-1}{15} & \quad \frac{6}{2} & \quad \frac{10}{12} & \quad \frac{6}{2} & \quad \frac{-2}{2}
\end{align*}
\]

\begin{align*}
\text{H} & \quad 9x - 5x = 7 \\
\text{O} & \quad 4x - 7x = 13 \\
\text{Y} & \quad -2u + 8u = -15 \\
\text{T} & \quad -4y - y = -3 \\
\text{W} & \quad \frac{2}{3}m = 7 \\
\text{E} & \quad \frac{5}{4}x = \frac{1}{2} \\
\text{U} & \quad \frac{-7}{2}w = 20 \\
\text{G} & \quad \frac{3}{5}t = -12 \\
\text{M} & \quad 8 = -18y \\
\text{N} & \quad -30 = 3n - 12n \\
\text{R} & \quad \frac{1}{12}m = -\frac{2}{3} \\
\text{A} & \quad -11 - 4 = -\frac{9}{4} \\
\text{L} & \quad -10z = \frac{2}{3} \\
\text{S} & \quad 8y - 9y = 4
\end{align*}
**FIND A MATCH**

Solve any equation in the top block and find the solution in the bottom block. Transfer the word from the top box to the corresponding bottom box. Keep working and you will get another corny joke.

<table>
<thead>
<tr>
<th>Equation</th>
<th>Solution</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4x - 6 = 22$</td>
<td>$x = -10$</td>
<td>THEY</td>
</tr>
<tr>
<td>$9x + 2 = 47$</td>
<td>$x = -8$</td>
<td>IT</td>
</tr>
<tr>
<td>$2x + 1 = -15$</td>
<td>$x = -4$</td>
<td>SOMETHING</td>
</tr>
<tr>
<td>$-6x - 11 = 49$</td>
<td>$x = -2$</td>
<td>SOME</td>
</tr>
<tr>
<td>$-4x + 6 = -42$</td>
<td>$n = -1$</td>
<td>BECAUSE</td>
</tr>
<tr>
<td>$-11x + 4 = 26$</td>
<td>$n = 7$</td>
<td>A</td>
</tr>
<tr>
<td>$8x - 18 = 6$</td>
<td>$n = 12$</td>
<td>ARE</td>
</tr>
<tr>
<td>$7 + 3x = 25$</td>
<td>$n = 12$</td>
<td>CALL</td>
</tr>
<tr>
<td>$1 - 9n = -80$</td>
<td>$x = 3$</td>
<td>AN</td>
</tr>
<tr>
<td>$-5 - 15n = 10$</td>
<td>$n = 3$</td>
<td>FARMERS</td>
</tr>
<tr>
<td>$12n + 2 = -46$</td>
<td>$n = 4$</td>
<td>CORN</td>
</tr>
<tr>
<td>$-4 - 2n = 60$</td>
<td>$n = 9$</td>
<td>SELLING</td>
</tr>
<tr>
<td>$-5n + 9 = -46$</td>
<td>$n = -32$</td>
<td>COSTS</td>
</tr>
<tr>
<td>$-27 + 4n = 33$</td>
<td>$n = 4$</td>
<td>EAR</td>
</tr>
<tr>
<td>$-7n - 20 = -48$</td>
<td>$n = 11$</td>
<td>PIRATE</td>
</tr>
<tr>
<td>$19 - 3n = 82$</td>
<td>$n = 15$</td>
<td>BUCK</td>
</tr>
</tbody>
</table>
Test of Knowledge

1. What Do A Decimal Number And A Thumbtack Have In Common?

ANSWER: \(-5\ 10\ 18\ 4\ 4\ 10\ 5\ 10\ -8\ 7\ 3\ -4\ -7\)

2. What Did Mergatroid Get For Losing 20 Pounds?

ANSWER: \(-7\ 4\ -5\ -4\ 7\ 14\ -5\ -6\ -6\ 9\ -8\ -11\ 3\ 8\ -5\)

3. What Happened To The Man Who Fell Into The Bubble-Gum-Mixing Machine?

ANSWER: \(4\ 3\ 5\ 14\ 7\ 5\ 5\ 18\ 4\ -5\ 6\ -5\ -1\ 4\ 3\ -2\ 7\ 12\ -7\)

TO DECODE THE ANSWERS TO THESE THREE QUESTIONS:
Solve any equation below and find the solution in the code. Each time the solution appears, write the letter of that exercise above it. Keep working and you will discover the answer to each question.

\[\begin{align*}
\text{S} & \quad 3y - 7 = 8 \\
\text{M} & \quad 6x + 2 = -10 \\
\text{T} & \quad -4x + 6 = 34 \\
\text{U} & \quad 15 = 2m - 9 \\
\text{N} & \quad 29 = -8t - 3 \\
\text{A} & \quad 7 - 5u = -43 \\
\text{W} & \quad 14 + 4x = 38 \\
\text{I} & \quad -30 = -9x - 3 \\
\text{K} & \quad -57 = -12 + 3r \\
\text{L} & \quad -7x + 1 = 43 \\
\text{Z} & \quad -40 = 8 - 6s \\
\text{D} & \quad -13x - 19 = -6 \\
\text{Y} & \quad -12 = y - 21 \\
\text{P} & \quad 5 - m = 13 \\
\text{C} & \quad 2w + 17 = 53 \\
\text{F} & \quad 10x + 11 = -19 \\
\text{O} & \quad -8 = 27 - 5x \\
\text{B} & \quad -44 = -3k - 2 \\
\text{E} & \quad -4 - 8y = 36 \\
\text{H} & \quad 37 + 12t = 85 \\
\text{R} & \quad -13 = 7y + 64
\end{align*}\]
Daffynition Decoder

1. Condense:

\[ -50 \ 45 \ 21 \ -63 \ -8 \ 44 \ 32 \ -40 \ -63 \ -40 \ -72 \ -50 \ -28 \]

2. Program:

\[ -40 \ -72 \ -5 \ -50 \ 19 \ 14 \ 32 \ 14 \ -5 \ -180 \ 6 \ 4 \ -63 \ 4 \ -180 \ 32 \ -40 \ 44 \ 18 \ 36 \ 18 \ -180 \ 4 \ -63 \]

Solve any equation below and find the solution in the code. Each time it appears, write the letter of the exercise above it. Keep working and you will decode the two de-fun-itions.

R \[ \frac{x}{2} - 5 = 11 \]
O \[ \frac{w}{7} + 4 = 6 \]
Y \[ \frac{1}{3} t - 9 = 3 \]
E \[ 7y - 2 = 26 \]
B \[ 8 - 4k = 40 \]
A \[ \frac{-1}{5} k + 1 = 11 \]
N \[ 7 + \frac{m}{8} = -2 \]
U \[ 47 = 2d + 5 \]
H \[ -6u + 7 = -29 \]
C \[ 12 - \frac{v}{4} = 1 \]
L \[ -6 - \frac{1}{2} n = 8 \]
F \[ -61 = 12p - 1 \]
T \[ \frac{1}{10} y + 2 = -16 \]
D \[ 18 - \frac{x}{15} = 15 \]
V \[ 3 + 5q = 98 \]
S \[ -6 + \frac{1}{3} w = 0 \]
I \[ 10 - x = 50 \]
M \[ \frac{-v}{9} + 7 = 14 \]
THE NAME OF A FAMOUS OCEAN LINER IS HIDDEN IN THE RECTANGLE ABOVE. TO FIND IT:

Solve each equation below and find the solutions in the rectangle. Shade in each area that contains a solution. When you finish, you will know the name of this famous ocean liner.

\[
\begin{align*}
\text{1.} & \quad 5x + 7 = 4 \\
\text{2.} & \quad 8t - 3 = 9 \\
\text{3.} & \quad \frac{m}{3} + 5 = -2 \\
\text{4.} & \quad -\frac{3}{4}x + 4 = -2 \\
\text{5.} & \quad -9 - 7x = 5 \\
\text{6.} & \quad 12 - \frac{3}{2}y = 4 \\
\text{7.} & \quad \frac{4}{3}x + 2 = -1 \\
\text{8.} & \quad -7 = 12n - 4 \\
\text{9.} & \quad 16 = -8 - 9y \\
\text{10.} & \quad \frac{u}{5} - 7 = -6 \\
\text{11.} & \quad -\frac{w}{4} + 3 = 8 \\
\text{12.} & \quad 5 = -4y - 21 \\
\text{13.} & \quad -9 = \frac{2}{3}x - 17 \\
\text{14.} & \quad -12 = -7 - \frac{7}{2}s \\
\text{15.} & \quad -28 + 15y = 17 \\
\text{16.} & \quad \frac{3}{5}x + 2 = 0 \\
\text{17.} & \quad -6 = 14 - \frac{z}{3} \\
\text{18.} & \quad 4 + \frac{1}{6}n = 3 \\
\text{19.} & \quad -8x + 59 = 25 \\
\text{20.} & \quad 18 = -8 + 10x \\
\text{21.} & \quad -\frac{7}{3}r - 2 = 3 \\
\text{22.} & \quad -14 - \frac{v}{9} = -12 \\
\text{23.} & \quad 15 = 18x - 1 \\
\text{24.} & \quad \frac{2}{5}y - 7 = -11
\end{align*}
\]
What Is The Title Of This Picture?

**CODED TITLE:**

18 6 6 2 5 7 2 5 3 6 5
7 1 4 4 7 8 5 3 7
-13 6 2 1 3 1 3 8 4 -13 7 -2

TO DECODE THE TITLE OF THIS PICTURE:

Solve any equation below and find the solution in the code above. Each time the solution appears, write the letter of that exercise above it. Keep working and you will discover the title.

1. $5 (x + 4) = 40$
2. $-2 (3y - 7) = 56$
3. $6 (1 - 4w) = -18$
4. $4 (2x + 5) - 8 = 36$
5. $2 (5 - 3v) + 9v = 28$
6. $7 - 3 (5t - 10) = 67$
7. $-9 (6 + u) - 2u = -10$
8. $13x + 7 (-3x - 1) = -63$
9. $15 - (4m - 5) = 32$
10. $-2 (-7k + 4) + 9 = -13$
11. $-5y - 5 (-6 - 2y) = 0$
12. $3 (1 + 4n) - 2 (5n - 3) = 25$
13. $-6 (x - 2) + 4 (3 - 6x) = -36$
14. $5 (4 + 2x) - (8x - 12) = 68$
15. $-3 (-4 - 6y) + 7 (-y + 5) = -8$
16. $8 (2w - 6) + 4 (-1 - 5w) = 0$
Why Did The Banana Go Out With The Prune?

TO ANSWER THIS QUESTION: Cross out each box that contains the solution of one of the equations.
When you finish, write the letters in order from the boxes that are not crossed out in the boxes at the bottom of the page.

1. $5 (2x - 3) + 8 = 9$
2. $4 (9 + 3t) - 12 = -6$
3. $7y - 2 (8y + 1) = 4$
4. $3 = 7 (4 - 2u) - 6u$
5. $50 = 15 - 6 (2x - 5)$
6. $3 (-6x + 9) - 10x = 1$
7. $-9 (8 - m) - 13 = 5$
8. $-8x + 6 (3x + 5) = -25$
9. $12 (4 + n) + 5 (-2n - 9) = 18$
10. $-2 = -4 (-7y + 1) + 5 (8 + 2y)$
11. $18 (-x - 2) - 4 (-9 + 3x) = -14$
12. $3 (6s + 12) - (10s - 6) = 0$
13. $-6 (4x + 1) + 7x + 9 (x - 3) = 4$
14. $10 (-3 - 2t) + 10 - 2 (6t - 13) = 0$
15. $-7 = -5y + 4 (-y + 9) - 7 (7 + 3y)$
16. $-15p - 1) + 24 + 2 (5 + 5p) = 0$
Solve the equations at the right and find the solutions below. Connect the dots in the order of the numbered equations. You may go through the same dot more than once.

THIS PUZZLE WILL MAKE YOU A STAR!

1. $5x + 6 = 2x + 15$
2. $7x - 4 = 20 + 3x$
3. $2x + 15 = 43 - 5x$
4. $3 + 4x = 9x + 13$
5. $2x - 10 = 44 + 8x$
6. $-7x - 2 = 24 - 9x$
7. $27 - 11x = x - 33$
8. $21x + 6 = 17x - 26$
9. $11x = 8x - 6$
10. $-x - 29 = 13 + 2x$
11. $-18 + 5x = -12x - 1$
12. $-9x - 21 = 35 - x$
13. $7x - 2 = -2x - 29$
14. $36 + 15x = 17x$
15. $-15 - 4x = 6 - 3x$
16. $12x - 9 = 8x - 37$
17. $-5x + 40 = 6x - 70$
18. $-x - 2 = 1 - 2x$
What Is The Title Of This Picture?

9 10 25 9 8 3 4 25 9 1 7 1 10 14 1 6 1
8 7 6 1 25 4 12 1 4 9 2
8 5 12 25 1 3 3 4

TO DECODE THE TITLE OF THIS PICTURE:
Solve any equation below and find the solution in the coded title. Each time it appears, write the letter of the exercise above it. Keep working and you will decode the title.

- D 4 (2n - 5) = 3n + 10
- L 2 (4x + 7) = 2x - 4
- N 8 (k + 3) = 12k - 4
- H -3 (5 - 9v) = 25 + 7v
- A 6x + 4 = 5 (3x + 8)
- I 5 - 11t = 7 (5 - 2t)
- B -2 (18 - 3y) = 7y + 2y
- M 2 (4a - 12) + 3a = 6a + 1
- P 9 (2 + w) - 4w = 3w - 10
- U 10u + 7 = 8 (2u - 4) - 9
- T 3 (4d + 1) - 9d = 6 (2 - d)
- R 6 (1 + 3m) = -8 (-2m + 5) - 4
- E -14 + 3 (x + 10) = 7 (2x + 4) + x
- C 6p - (5p + 5) = -8 - 2(p + 12)
What Did the Electrician Say After Fixing a Light Bulb at the Top of the Empire State Building?

Translate any phrase below into algebraic terms and find your answer in the corresponding answer column. Write the letter of the exercise in the box that contains the number of the answer. Keep working and you will discover the answer to the title question.

<table>
<thead>
<tr>
<th>Exercise Number</th>
<th>Description</th>
<th>Algebraic Expression</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>F 27</td>
<td>5 more than 2 times a number</td>
<td>$5x - 2$</td>
<td>8</td>
</tr>
<tr>
<td>H 11</td>
<td>7 less than 5 times a number</td>
<td>$7x + 2$</td>
<td>3(x + 8)</td>
</tr>
<tr>
<td>E 22</td>
<td>5 times a number, decreased by 2</td>
<td>$2 + 5x$</td>
<td>3(2x + 8)</td>
</tr>
<tr>
<td>I 19</td>
<td>2 diminished by 7 times a number</td>
<td>$2x + 5$</td>
<td>2(x + 8)</td>
</tr>
<tr>
<td>S 6</td>
<td>2 increased by 5 times a number</td>
<td>$2x - 7$</td>
<td>8x + 3</td>
</tr>
<tr>
<td>T 7</td>
<td>twice a number, decreased by 7</td>
<td>$5x - 7$</td>
<td>2x + 8</td>
</tr>
<tr>
<td>G 14</td>
<td>2 more than 7 times a number</td>
<td>$2 - 7x$</td>
<td>8(x + 3)</td>
</tr>
<tr>
<td>A 16</td>
<td>9 less than a number</td>
<td>$9x + 4x$</td>
<td></td>
</tr>
<tr>
<td>I 4</td>
<td>4 times a number, plus 9</td>
<td>$x - 9$</td>
<td></td>
</tr>
<tr>
<td>T 2</td>
<td>9 diminished by 4 times a number</td>
<td>$9 - 4x$</td>
<td></td>
</tr>
<tr>
<td>O 5</td>
<td>one-fourth of a number</td>
<td>$9x - 4$</td>
<td></td>
</tr>
<tr>
<td>S 26</td>
<td>9 times a number, decreased by 4</td>
<td>$9x + 4$</td>
<td></td>
</tr>
<tr>
<td>E 21</td>
<td>4 more than 9 times a number</td>
<td>$4x + 9$</td>
<td></td>
</tr>
<tr>
<td>H 18</td>
<td>9 times a number, increased by 4 times the number</td>
<td>$x$</td>
<td></td>
</tr>
<tr>
<td>A 16</td>
<td>9 less than a number</td>
<td>$9x + 4x$</td>
<td></td>
</tr>
<tr>
<td>I 4</td>
<td>4 times a number, plus 9</td>
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<tr>
<td>T 2</td>
<td>9 diminished by 4 times a number</td>
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<tr>
<td>O 5</td>
<td>one-fourth of a number</td>
<td>$9x - 4$</td>
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<td>S 26</td>
<td>9 times a number, decreased by 4</td>
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<td>E 21</td>
<td>4 more than 9 times a number</td>
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<td>H 18</td>
<td>9 times a number, increased by 4 times the number</td>
<td>$x$</td>
<td></td>
</tr>
<tr>
<td>L 1</td>
<td>10 meters higher than height x</td>
<td>$x - 50$</td>
<td></td>
</tr>
<tr>
<td>C 12</td>
<td>10 mph slower than speed x</td>
<td>$x + 10$</td>
<td></td>
</tr>
<tr>
<td>H 25</td>
<td>50 mph faster than speed x</td>
<td>$2x + 6$</td>
<td></td>
</tr>
<tr>
<td>T 17</td>
<td>6 mph faster than speed x</td>
<td>$2x - 2$</td>
<td></td>
</tr>
<tr>
<td>R 13</td>
<td>6 years older than twice age x</td>
<td>$x - 10$</td>
<td></td>
</tr>
<tr>
<td>H 9</td>
<td>2 years younger than 6 times age x</td>
<td>$x + 50$</td>
<td></td>
</tr>
</tbody>
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**Note:** The table above contains the algebraic expressions and their corresponding answers based on the given exercises. The exercises are designed to test the student's ability to translate verbal descriptions into algebraic expressions.
Why Did Elmo Take A Bath After Walking Through Mudsucker Swamp?

TO ANSWER THIS QUESTION: Solve any problem below and find your answer at the bottom of the page. Write the letter of the problem above it. Keep working and you will get the answer.

1. Nine more than a number is 33. Find the number.
2. Four less than a number is 17. Find the number.
3. A number decreased by 16 is -26. Find the number.
4. Eight times a number is -96. Find the number.
5. One-fifth of a number is 14. Find the number.
6. One-fourth of a number is -60. Find the number.
7. Juan weighs 53 kg. This is 5 kg more than Bill weighs. How much does Bill weigh?
9. A set of eight plates costs $112. What is the cost of each plate?
10. An apple has 75 calories. This is \( \frac{1}{8} \) of the number in a hot fudge sundae. How many calories are in the sundae?
11. A salesman earned $420. This was \( \frac{1}{10} \) of his sales dollars. How much did he sell (in dollars)?
12. The height of the shortest man in history was 68 cm. This is 204 cm less than the height of the tallest man. How tall was the tallest man?
13. The perimeter of a square is 320 cm. Find the length of each side.
14. A college has 600 openings in its freshman class. In past years, an average of \( \frac{1}{3} \) of those accepted have come. About how many applicants should the college accept?
What Do Smokey The Bear And Alexander The Great Have In Common?

Solve any problem below. Find your answer in the answer column and notice the letter next to it. Write this letter in each box that contains the number of that problem. Keep working and you will discover the answer to the title question.

1. Seven more than 3 times a number is 31. Find the number. ________
2. Three more than 8 times a number is 29. Find the number. ________
3. Five less than 6 times a number is 61. Find the number. ________
4. Six decreased by 9 times a number is -39. Find the number. ________
5. Two-thirds of a number is 36. Find the number. ________
6. Four times a number, increased by 10, is 2. Find the number. ________
7. Three-eighths of a number, decreased by 1, is 5. Find the number. ________
8. Seven diminished by 1/4 of a number is 15. Find the number. ________
9. The Nile River is 6690 kilometers long. This is 394 kilometers longer than the Amazon River. How long is the Amazon River? ________ km
10. The fastest speed recorded for a cheetah is 70 mph. This is 11 mph less than 3 times the fastest running speed for a man. What is the fastest running speed for a man? ________ mph
11. The Empire State Building is 1250 feet tall. This is 140 feet more than twice the height of the Washington Monument. How tall is the Washington Monument? ________ ft
12. A medium apple has 72 calories. This is 3/4 of the calories in a medium banana. How many calories does a medium banana have? ________ cal
13. The width of a singles tennis court is 27 feet. This is 1 foot more than 3/4 of the length. What is the length of the court? ________ ft
14. A golf ball can travel 170 mph. This is 10/7 times the fastest speed recorded for a hockey puck. What is the record speed for a hockey puck? ________ mph
Why Is A Yo-Yo Like Waking Up At 5 A.M.?

Solve each problem and find your answers at the bottom of the page. Shade out the letter above each correct answer. When you finish, the answer to the title question will remain!

1. The second of two numbers is 4 times the first. Their sum is 45. Find the numbers.

2. The greater of two numbers is 3 times the smaller. Their sum is 44. Find the numbers.

3. The second of two numbers is 7 more than the first. Their sum is 47. Find the numbers.

4. The greater of two numbers is 10 more than the smaller. Their sum is 38. Find the numbers.

5. The sum of two numbers is 31. The first is 5 less than the second. Find the numbers.

6. The second of two numbers is 1 more than twice the first. Their sum is 25. Find the numbers.

7. The greater of two numbers is 8 more than 5 times the smaller. Their sum is 68. Find the numbers.

8. The second of two numbers is 3 less than twice the first. Their sum is 42. Find the numbers.

9. Find two numbers whose sum is 33, if the second is 2 less than 4 times the first.

10. A basketball player shot 70 times. The number of missed shots was 6 more than the number of baskets. How many baskets did the player make?

11. The entertainment portion of a 60-minute TV program lasted 4 times as long as the advertising portion. How many minutes of advertising were there?
When Should A Mountain Climber NOT Call For Help?

TO ANSWER THIS QUESTION: Cross out each box that contains the answer to a problem. When you finish, write the letters from the boxes that are not crossed out in the boxes at the bottom of the page.

1. The second of 2 numbers is 7 times the first. Their sum is 32. Find the numbers.
2. The second of 2 numbers is 5 more than twice the first. Their sum is 29. Find the numbers.
3. The sum of 2 numbers is 42. The first is 6 less than 3 times the second. Find the numbers.
4. The greater of 2 numbers is 9 more than the smaller. Their sum is 67. Find the numbers.
5. Find 2 numbers whose sum is 49, if the greater is 4 more than 8 times the smaller.
6. The first of 2 numbers is 7 less than 5 times the second. Their sum is 113. Find the numbers.
7. A 75-meter rope is cut so that one piece is 13 meters shorter than the other. Find the length of each piece.
8. Grandpa’s age is 7 years less than 6 times Junior’s age. The sum of their ages is 70. Find each of their ages.
9. The sum of 3 numbers is 45. The first number is 4 times the second, while the third is 9 more than the second. Find the numbers.
10. The sum of 3 numbers is 49. The second number is twice the first, and the third is 1 less than the second. Find the numbers.
11. The sum of 3 numbers is 79. The second number is 9 times the first, and the third is 3 more than the second. Find the numbers.
12. The sum of the angle measures of any triangle is $180^\circ$. Find each of the angle measures of a triangle if the second angle measures $10^\circ$ more than twice the first, and the third angle measures $10^\circ$ more than the second.

<table>
<thead>
<tr>
<th>IFT</th>
<th>HIS</th>
<th>WHE</th>
<th>REA</th>
<th>NHE</th>
<th>LPI</th>
<th>ISO</th>
<th>SHA</th>
<th>SLO</th>
<th>NGI</th>
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</thead>
<tbody>
<tr>
<td>31 m; 44 m</td>
<td>30; 12</td>
<td>20; 5; 14</td>
<td>93; 20</td>
<td>9; 61</td>
<td>11; 59</td>
<td>29; 38</td>
<td>5; 45; 48</td>
<td>4; 36; 39</td>
<td>29 m, 46 m</td>
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</tbody>
</table>

<table>
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<th>WFA</th>
<th>YHI</th>
<th>SFA</th>
<th>LLA</th>
<th>STE</th>
<th>EPA</th>
<th>TOG</th>
<th>ETH</th>
<th>ELP</th>
</tr>
</thead>
<tbody>
<tr>
<td>20$^\circ$; 75$^\circ$; 85$^\circ$</td>
<td>24; 6; 15</td>
<td>95; 18</td>
<td>5; 44</td>
<td>4; 28</td>
<td>7; 19</td>
<td>8; 21</td>
<td>10; 20; 19</td>
<td>9; 18; 17</td>
<td>30$^\circ$; 70$^\circ$; 80$^\circ$</td>
</tr>
</tbody>
</table>
### Books Never Written

#### Tragedy on the Cliff by

| 4 | 7 | 3 | 4 | 4 | 11 | 6 | 12 | 7 | 4 | 5 |

#### Mystery of the Creaking Door by

| 5 | 15 | 10 | 9 | 18 | 7 | 11 | 4 | 10 |

#### P.S. by

| 1 | 6 | 1 | 3 | 7 | 11 | 4 | 2 | 12 | 12 | 5 | 4 |

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**A**BOVE ARE THE TITLES OF THREE "BOOKS NEVER WRITTEN." TO DECODE THE NAMES OF THEIR AUTHORS, FOLLOW THESE DIRECTIONS:

Solve any problem below and find your answer in the code. Each time it appears, write the letter of that problem above it. Keep working and you will decode the names of all three authors.

| L | Eight less than 7 times a number is the same as 4 more than 3 times the number. Find the number. |
| H | Twice a number plus 6 times the number is -72. Find the number. |
| V | Four more than 6 times a number is the same as 9 times the number increased by 10. Find the number. |
| T | A number plus 5 more than 3 times the number is 37. Find the number. |
| I | Four times a number is the same as 14 less than twice the number. Find the number. |
| A | Eleven diminished by 5 times a number is the same as 4 times the number increased by 20. Find the number. |
| Y | One more than 8 times a number is the same as 12 times the number decreased by 3. Find the number. |
| S | Eight times a number is the same as 90 decreased by the number. Find the number. |
| G | Twelve less than a number is the same as 5 times the number increased by 4. Find the number. |
| U | Nine more than 3 times a number is the same as 6 less than twice the number. Find the number. |
| D | Twenty decreased by 2 times a number is the same as 10 less than 3 times the number. Find the number. |
| O | One increased by 7 times a number is the same as 5 times the number plus 25. Find the number. |
| M | Two more than a number is the same as 16 decreased by 6 times the number. Find the number. |
| E | Twenty-eight decreased by 6 times a number is the same as the number. Find the number. |
| R | Four times a number decreased by 25 is the same as 9 times the number. Find the number. |
| N | Sixteen diminished by 8 times a number is the same as 5 diminished by 9 times the number. Find the number. |
**DIRECTIONS:**

Solve any problem below. Find your answer in the answer column and notice the word next to it. Write this word in the box with the same letter as that problem.

*KEEP WORKING AND YOU WILL HEAR ABOUT A GUY WITH HORSE SENSE.*

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>H</td>
<td>I</td>
<td>J</td>
<td>K</td>
<td>?</td>
</tr>
</tbody>
</table>

- **A** Five times the sum of a number and 2 is 25. Find the number.
- **B** Three times the sum of a number and −7 is 12. Find the number.
- **C** Twice the sum of a number and 3 is the same as 11 increased by the number. Find the number.
- **D** Seven times the sum of a number and 4 is the same as 8 decreased by 3 times the number. Find the number.
- **E** Nine less than 5 times a number is equal to twice the sum of the number and 6. Find the number.
- **F** Six times the sum of a number and −1 is the same as 2 more than 8 times the number. Find the number.
- **G** The greater of two numbers is 5 more than the smaller. If the smaller is added to twice the greater, the result is 22. Find both of the numbers.
- **H** The smaller of two numbers is 3 less than the larger. Twice the larger plus 4 times the smaller is 36. Find the numbers.
- **I** The first of two numbers is 9 more than the second. Three times the first number is equal to 7 more than 5 times the second. Find the numbers.
- **J** The second of two numbers is 3 times the first. Eight times the sum of the first number and −2 is equal to the second number decreased by 11. Find the numbers.
- **K** The second of two numbers is 6 less than the first. Twice the sum of the first number and 1 is the same as 9 times the second number. Find the numbers.
Why Does Batman Brush His Teeth So Often?

Solve any problem below. Find your answer in the answer column and notice the letter next to it. Write this letter in each box that contains the number of that problem. Keep working and you will discover the answer to the title question.

1. The length of a rectangle is 7 centimeters greater than the width. The perimeter is 54 centimeters. Find the length and width.
   - Answer: K

2. The length of a rectangle is 3 times the width. The perimeter is 120 meters. Find the length and width.
   - Answer: D

3. The length of a rectangle is 5 centimeters more than twice the width. The perimeter is 82 centimeters. Find the length and width.
   - Answer: R

4. The perimeter of a rectangle is 400 meters. The length is 15 meters less than 4 times the width. Find the length and width.
   - Answer: N

5. The perimeter of a triangle is 26 centimeters. Side $a$ of the triangle is 3 centimeters longer than side $b$. Side $c$ is 1 centimeter shorter than twice side $b$. Find the length of each side.
   - Answer: M

6. The first side of a triangle is 8 meters longer than twice the second side. The third side is 3 times the second side. The perimeter is 128 meters. Find the lengths of the three sides.
   - Answer: I

7. Side $a$ of a triangle is twice side $b$. Side $c$ is 2 meters shorter than side $a$. The perimeter is 98 meters. Find the length of each side.
   - Answer: E

8. The perimeter of a triangle is 33 centimeters. The first side is 5 centimeters shorter than the second, and the third is twice the first. Find the lengths of the sides.
   - Answer: L

9. An ice hockey rink is a rectangle with a perimeter of 174 meters. The length is 9 meters more than twice the width. Find the length and width.
   - Answer: A

10. A triangular course for a sailing race is marked off by buoys. The first leg is 250 meters longer than the second, and the third leg is 100 meters shorter than the first. If the length of the course is 2500 meters, find the length of each leg.
    - Answer: S
Why Did The Kangaroo See A Psychiatrist?

Find the graph of the solution set of any inequality below in the corresponding column of graphs. Notice the letter next to it. Write this letter in each box that contains the number of that exercise. Keep working and you will discover the answer to the title question.

1. $x < 1$
   - Graph H

2. $x \leq 1$
   - Graph Y

3. $x > 1$
   - Graph S

4. $x \geq 1$
   - Graph I

5. $x \neq 1$
   - Graph D

6. $x < -2$
   - Graph L

7. $x > -2$
   - Graph R

8. $x \leq -2$
   - Graph G

9. $x \geq -2$
   - Graph A

10. $x < -1$
    - Graph O

11. $-1 < x$
    - Graph U

12. $3 \geq x$
    - Graph M

13. $x < 3$
    - Graph F

14. $x \neq 0$
    - Graph E

15. $0 \leq x$
    - Graph P

16. $0 \geq x$
    - Graph W

17. $0 < x$
    - Graph J

18. $0 > x$
    - Graph N
Why Did Farmer Jones Keep The Chickens Away From The Other Animals?

Solve any inequality below. CIRCLE the letter next to the correct answer. Write this letter in the box at the bottom of the page that contains the number of that exercise. Keep working and you will discover the answer to the title question. Two of the numbers will not be used.

<p>| | | | | | | | | | | |</p>
<table>
<thead>
<tr>
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<td>-6x &lt; 12</td>
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<td>(D) x &gt; -12</td>
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<td>(D) x &lt; -2</td>
<td></td>
<td>(F) x &lt; 4</td>
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<td>(U) n ≤ 30</td>
<td></td>
<td>(G) x &lt; -12</td>
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<td>(S) x ≥ 5</td>
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<td>(E) x &gt; 2</td>
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<td>(P) x ≥ 21</td>
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<td>(L) x ≤ 5</td>
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<tr>
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<td>(G) z &gt; -7</td>
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<td>(E) t ≥ 17</td>
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<td>(A) z &lt; -7</td>
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<td>(P) t ≤ 17</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>6x &lt; 12</td>
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<td>4a ≤ -20</td>
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<td>(V) x &gt; 2</td>
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<td>(S) m ≥ 14</td>
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<td>(T) x &lt; 12</td>
<td></td>
<td>(C) k &lt; 8</td>
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Why Did They Try To Build A House On Orgo's Head?

Solve any inequality below and draw a straight line connecting it to the inequality that describes the solution set. The line will cross a number and a letter. The number tells you where to put the letter in the boxes at the bottom of the page. Keep working and you will discover the answer to the title question.

1. $3x + 8 > 2$  
   $x \geq -21$

2. $7x - 1 < 20$  
   $x > 5$

3. $8 - 4x > -12$  
   $x > -2$

4. $-5x - 9 \geq -4$  
   $x > -4$

5. $63 + 12x < 15$  
   $x \leq 7$

6. $-8x + 25 \leq -31$  
   $x < 3$

7. $-10 + 2x \geq -52$  
   $x \leq -1$

8. $15 > 6x - 9$  
   $x < 14$

9. $48 < 20 - 14x$  
   $x \geq 7$

10. $-60 \geq 9x + 3$  
    $x \leq -7$

11. $18 - 10x < -22$  
    $x > -9$

12. $7 < 3x - 8$  
    $x < 5$

13. $-12x - 8 \leq 64$  
    $x < 4$

14. $-17 > -7x - 45$  
    $x \geq -11$

15. $3x - 42 < 0$  
    $x \geq -6$

16. $44 \geq -8x - 44$  
    $x < -4$

17. $4x + 12 > -24$  
    $x < -2$
# Did you hear about...

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
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<tbody>
<tr>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
<td>J</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
<td>O</td>
<td></td>
</tr>
</tbody>
</table>

**DIRECTIONS:**
Solve any inequality below. In the answer column, find the inequality that describes the solution set and notice the word next to it. Write this word in the box that has the same letter as that exercise.

**KEEP WORKING AND YOU WILL HEAR ABOUT A COLLEGE EYE DEAL.**

- A: \(2(3x - 5) > 2x + 6\)
- B: \(8(2 + x) \leq 3x - 9\)
- C: \(-3(4x - 6) < 7 - x\)
- D: \(13x - 7(-2 + x) \geq 4x - 10\)
- E: \(5(-3x - 1) + 7 \leq -x + 30\)
- F: \(12 + 5x > 2(8x - 6) - 7x\)
- G: \(9x - 2x \geq 14 - 9(-x - 4)\)
- H: \(-4(3 - 5x) - 11x < 3x + 6\)
- I: \(10(x + 2) > -2(6 - 9x)\)
- J: \(7(2 + 2x) \geq 4(-x - 10)\)
- K: \(11 + 3(-8 + 5x) < 16x - 5\)
- L: \(-6(7x - 1) < -8x + 9(-3x - 4)\)
- M: \(-9x + 2(4x + 12) \leq 4(1 - 3x) - 13\)
- N: \(7(-x + 4) + 16 \geq 5x - (10x - 6) - 6\)
- O: \(12(2x + 3) - 3(8 + 7x) > 0\)
Watch Out!

A FRIENDLY WARNING is hidden below. To discover it, find the union or intersection for each pair of sets. Then arrange the elements of each solution set to form a word.

1. \( \{A, F, I, L\} \cap \{P, I, F\} \) → __________

2. \( \{N, A\} \cup \{A\} \) → __________

3. \( \{B, X, L, R, A\} \cap \{V, P, X, A, M\} \) → __________

4. \( A = \{R, S, P, O\} \)
   \( B = \{D, O, S, R\} \) → \( A \cup B \) → __________

5. \( X = \{O, B, N\} \)
   \( Y = \{L, N, C, S, O\} \) → \( X \cap Y \) → __________

6. \( \{R, O, U, Y\} \cup \{U, R, O\} \) → __________

7. \( A = \{R, A, Y, K, W, C\} \)
   \( B = \{L, A, C, I, R\} \) → \( A \cap B \) → __________

8. \( \{O, U, S, Y\} \cap \{T, U, Y, V, O\} \) → __________

9. \( X = \{M, T, G, H\} \)
   \( Y = \{G, I, M, T\} \) → \( X \cup Y \) → __________

10. \( \{V, H, A, E\} \cup \{A, V\} \) → __________

11. \( A = \{Q, A, W, N, T\} \)
    \( B = \{B, N, A, J\} \) → \( A \cap B \) → __________

12. \( \{L, A, X\} \cap \{X, R, B, A\} \) → __________

13. \( X = \{E\} \)
    \( Y = \{D, T, E, N\} \) → \( X \cup Y \) → __________
Why Was The Hit Record Nervous?

1. \( A = \{ x | x > 2 \} \)
2. \( B = \{ x | x < -1 \} \)
3. \( X = \{ x | x \geq 2 \} \)
4. \( Y = \{ x | x \leq -1 \} \)
5. \( A = \{ x | x > 0 \} \)
6. \( B = \{ x | x < -3 \} \)
7. \( X = \{ x | x \geq 0 \} \)
8. \( Y = \{ x | x \leq -3 \} \)
9. \( A = \{ x | x > -2 \} \)
10. \( B = \{ x | x > 2 \} \)
11. \( X = \{ x | x \geq 1 \} \)
12. \( Y = \{ x | x \leq -3 \} \)
13. \( A = \{ x | x > -4 \} \)
14. \( B = \{ x | x < -2 \} \)

Find the UNION of the two given sets in the column of graphs below. Write the letter next to the graph in each box that contains the number of the exercise. Keep working and you will discover the answer to the title question.
What Did The Mother Worm Say To The Teenage Worm?

Find the INTERSECTION of the two given sets in the column of graphs below. Write the letter next to the graph in each box that contains the number of the exercise. Keep working and you will discover the answer to the title question.

1. \( R = \{ x \mid x > -2 \} \)
   \( S = \{ x \mid x < 3 \} \)
2. \( P = \{ x \mid x \geq -2 \} \)
   \( Q = \{ x \mid x < 3 \} \)
3. \( R = \{ x \mid x > 0 \} \)
   \( S = \{ x \mid x \leq 4 \} \)
4. \( P = \{ x \mid x \geq -3 \} \)
   \( Q = \{ x \mid x < -1 \} \)
5. \( R = \{ x \mid x > -1 \} \)
   \( S = \{ x \mid x > 2 \} \)
6. \( P = \{ x \mid x > -4 \} \)
   \( Q = \{ x \mid x \geq 0 \} \)
7. \( R = \{ x \mid x \leq -1 \} \)
   \( S = \{ x \mid x \leq -2 \} \)
8. \( P = \{ x \mid x \geq -3 \} \)
   \( Q = \{ x \mid x \leq 3 \} \)
9. \( R = \{ x \mid x < 2 \} \)
   \( S = \{ x \mid x < 4 \} \)
10. \( P = \{ x \mid x = 3 \} \)
   \( Q = \{ x \mid x < 4 \} \)
11. \( R = \{ x \mid x \geq 0 \} \)
   \( S = \{ x \mid x \leq -3 \} \)
12. \( P = \{ x \mid x \geq 0 \} \)
   \( Q = \{ x \mid x < 4 \} \)
13. \( R = \{ x \mid x \geq -2 \} \)
   \( S = \{ x \mid x = -2 \} \)

228  PRE-ALGEBRA WITH PIZZAZZ! © Creative Publications
What is
ABCDEFghijklmnopqrstuvwxyz, Slurp?

Match any compound inequality below with the graph of its solution set. Write the letter next to the graph in each box that contains the number of that exercise. Keep working and you will discover the answer to the title question.

1. \( \{x \mid x > 1 \text{ or } x \leq -2\} \)
2. \( \{x \mid x \geq -3 \text{ and } x < 2\} \)
3. \( \{x \mid x \geq 3 \text{ or } x \leq 0\} \)
4. \( \{x \mid x > 1 \text{ and } x < 4\} \)
5. \( \{x \mid x \geq -1 \text{ or } x < -2\} \)
6. \( \{x \mid x \geq -2 \text{ and } x \leq 3\} \)
7. \( \{x \mid x > 0 \text{ or } x > 2\} \)
8. \( \{x \mid x > 0 \text{ and } x > 2\} \)
9. \( \{x \mid x \leq -1 \text{ or } x < 0\} \)
10. \( \{x \mid x \leq -1 \text{ and } x < 0\} \)
11. \( \{x \mid x \geq 1 \text{ or } x \leq -1\} \)
12. \( \{x \mid x \geq 1 \text{ and } x \leq -1\} \)
13. \( \{x \mid x > -1 \text{ or } x \leq 3\} \)
14. \( \{x \mid x > -1 \text{ and } x \leq 3\} \)
What Did One Ear Say To The Other?

Each pair of numbers at the bottom of the page stands for a point on the coordinates below. Above each pair of numbers, write the letter that appears at that point.

(6,3)  (1,5)  (-4,6)  (-6,3)  (4,0)  (-5,0)  (-7,-8)  (-1,-5)  (7,-2)  (2,-4)  (0,2)  (0,-3)

(0,0)  (8,7)  (-6,-6)  (-3,2)  (5,-5)  (-8,-2)  (0,-7)  (-5,-4)  (-1,0)  (3,-8)  (-2,-3)

(-8,8)  (0,8)  (8,0)  (1,-1)  (-3,-8)  (-7,1)  (2,1)  (1,-6)  (4,6)  (-1,7)  (8,-6)  (3,8)
Graph the points in each group and connect each point with the next point using straight line segments. Do NOT connect the last point in one group with the first point in the next group. For the next-to-last group, you are asked to shade in the area formed by the points in that group. Use pencil so you can erase if necessary. It's gra-fun!

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
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<td>(-10, -12.5)</td>
<td>(4.5, -17)</td>
<td>(-5.5, -1)</td>
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<td>(6, 4)</td>
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<td>(10.5, 0.5)</td>
<td>(-2, -1.5)</td>
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<td>WITH THE</td>
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<td>POINTS ABOVE.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>STOP</td>
</tr>
</tbody>
</table>
How Did The Spanish Explorers Save Gas?

Complete the table for each function. Find any answer in the code key and notice the letter next to it. Write this letter in the box at the bottom of the page that contains the circled number from that row of the table. Keep working and you will discover the answer to the title question.

<table>
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<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>11</td>
</tr>
</tbody>
</table>

| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

**Function Values**

**1** \( f(x) = 2x \)

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**2** \( f(x) = x - 4 \)

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<td>-2</td>
<td>28</td>
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</table>

**3** \( f(x) = -3x \)

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<tr>
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**4** \( f(x) = -2x + 4 \)

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**5** \( f(x) = 1 + 5x \)

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**6** \( f(x) = 3x - 7 \)

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**7** \( f(x) = -x - 5 \)

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**8** \( f(x) = 6 - 2x \)

<table>
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</thead>
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<td>3</td>
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</tr>
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</table>
Why Did Orgo Take His Girl Friend To The Cornfield?

Complete the table for each function. Find each ordered pair in the code at the bottom of the page and write the corresponding letter above it. You will discover the answer to the title question (which is very corny).

<p>| | | | | |</p>
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</table>

**Coded Answer**

(-4,-9)(-4.5)(3,-2)(-3,3)(1,6)(1,-5)(0,-3)(-2,3)(-4,10)(3,1)(-3,-2)(-1,-5)(4,-9)(2,-2)(-1,-4)(2.5)(3,3)

(-2,11)(-5,12)(-3,0)(0,-5)(2,3)(3,12)(1,-7)(0,-6)(4,11)(4,10)(-2,-3)(-2,-2)(0,7)(2,-5)(1,0)(-1,1)(-1,6)
Why Couldn't The Bowlegged Cowboy Round Up The Herd?

Complete the table for each function. Find each answer in the boxes at the bottom of the page and write the corresponding letter above it. You will discover the answer to the title question.

<table>
<thead>
<tr>
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<th></th>
<th>( f(x) = 1 - 4x^2 )</th>
<th></th>
<th>( f(x) = \frac{x^2 + x}{x} )</th>
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</thead>
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<td>-2</td>
<td>E</td>
<td>2</td>
<td>L</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>-3</td>
<td>R</td>
<td>3</td>
<td>O</td>
<td>-3</td>
<td>A</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>-6</td>
<td>T</td>
<td>-5</td>
<td>T</td>
<td>0</td>
<td>O</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>( f(x) = (3x - 1)^2 )</th>
<th></th>
<th>( f(x) = x^3 - x^2 )</th>
<th></th>
<th>( f(x) = 2^x - 1 )</th>
<th></th>
<th>( f(x) = \frac{24}{x + 1} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( x )</td>
<td>( f(x) )</td>
<td>( x )</td>
<td>( f(x) )</td>
<td>( x )</td>
<td>( f(x) )</td>
<td>( x )</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>E</td>
<td>2</td>
<td>H</td>
<td>2</td>
<td>C</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>-1</td>
<td>R</td>
<td>-2</td>
<td>S</td>
<td>3</td>
<td>N</td>
<td>-2</td>
</tr>
<tr>
<td></td>
<td>-2</td>
<td>E</td>
<td>10</td>
<td>V</td>
<td>4</td>
<td>G</td>
<td>-4</td>
</tr>
<tr>
<td></td>
<td>-3</td>
<td>I</td>
<td>-10</td>
<td>T</td>
<td>6</td>
<td>H</td>
<td>-5</td>
</tr>
</tbody>
</table>

PRE-ALGEBRA WITH PIZZAZZ!

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23.
### Find The Message

TO FIND THE HIDDEN MESSAGE, FOLLOW THESE DIRECTIONS:

Each row across has 7 rectangles. Only 4 of them contain solutions of the equation or inequality at the beginning of that row. CIRCLE these 4 solutions.

Over each solution you have circled, notice the number and letter. The number tells you where to put the letter in the boxes at the bottom of the page. You will spell out a five-word message.

<table>
<thead>
<tr>
<th></th>
<th>12-T</th>
<th>5-O</th>
<th>19-E</th>
<th>17-S</th>
<th>7-V</th>
<th>24-D</th>
<th>11-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>2x + y = 5</strong></td>
<td>(2, 1)</td>
<td>(-2, 9)</td>
<td>(-1, 3)</td>
<td>(3, -1)</td>
<td>(0, 4)</td>
<td>(-1, 7)</td>
</tr>
<tr>
<td>2</td>
<td><strong>3x - y = -1</strong></td>
<td>(1, 2)</td>
<td>(2, 7)</td>
<td>(-2, -3)</td>
<td>(-1, -2)</td>
<td>(0, 1)</td>
<td>(3, -5)</td>
</tr>
<tr>
<td>3</td>
<td><strong>2x + 3y ≥ 0</strong></td>
<td>(-1, 2)</td>
<td>(0, -1)</td>
<td>(3, 0)</td>
<td>(-2, 1)</td>
<td>(5, -3)</td>
<td>(0, 0)</td>
</tr>
<tr>
<td>4</td>
<td><strong>-3x + 2y = 4</strong></td>
<td>(2, 5)</td>
<td>(0, 1/2)</td>
<td>(1, 7/2)</td>
<td>(2/3, 1)</td>
<td>(-1, 3/2)</td>
<td>(-2, -1)</td>
</tr>
<tr>
<td>5</td>
<td><strong>-x - 5y &lt; 1</strong></td>
<td>(-1, 0)</td>
<td>(0, 2)</td>
<td>(-7, 1)</td>
<td>(-5, 1)</td>
<td>(1, 2/5)</td>
<td>(-3, -1)</td>
</tr>
<tr>
<td>6</td>
<td><strong>2x + 5y = -2</strong></td>
<td>(-6, 2)</td>
<td>(5, -2)</td>
<td>(-1/2, -1/5)</td>
<td>(-3, 1)</td>
<td>(-1, 0)</td>
<td>(0, 2/5)</td>
</tr>
</tbody>
</table>

|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
Why Didn’t The Circus Managers Want Their Human Cannonball To Quit?

For any exercise below, solve the equation for \( y \) in terms of \( x \). Find your answer in the answer columns and notice the number to the left of it. Each time this number appears in the code, write the letter of that exercise above it. Keep working and you will discover the answer to the title question.

\[\begin{align*}
L: x + y &= 2 \\
F: -2x + y &= 5 \\
A: 5x + y &= -1 \\
U: -3x + y &= -4 \\
T: x - y &= 6 \\
E: -4x - y &= 3 \\
S: 2x - y &= -2 \\
Y: x + 2y &= 0 \\
D: x + 2y &= 5 \\
R: -3x + 2y &= 0 \\
V: -3x + 2y &= 4 \\
O: 6x + 3y &= 1 \\
M: 5x - 2y &= 0 \\
H: 4x - 2y &= 3 \\
B: -3x - 5y &= 10 \\
I: x + 4y &= -2 \\
N: -6x - 2y &= 5 \\
C: x - 3y &= -4
\end{align*}\]

**ANSWERS**

\[\begin{align*}
1: y &= -\frac{x}{2} \\
2: y &= -\frac{3}{5}x - 2 \\
3: y &= 3x - 4 \\
4: y &= \frac{x}{3} + \frac{4}{3} \\
5: y &= \frac{3}{2}x + 2 \\
6: y &= -x + 2 \\
7: y &= \frac{5}{2}x \\
8: y &= 2x + 2 \\
9: y &= \frac{-x}{2} + \frac{5}{2} \\
10: y &= -5x - 1 \\
11: y &= -3x - \frac{5}{2} \\
12: y &= x - 6 \\
13: y &= \frac{3}{2}x \\
14: y &= -\frac{x}{4} - \frac{1}{2} \\
15: y &= 2x + 5 \\
16: y &= -2x + \frac{1}{3} \\
17: y &= 2x - \frac{3}{2} \\
18: y &= -4x - 3
\end{align*}\]

**CODED ANSWER:**

12-17-18-1-4-16-3-6-9-11-18-5-18-13-15-14-11-9

10-11-16-12-17-18-13-7-10-11-16-15-17-14-8

4-10-6-14-2-13-18
Why Did Miss Muffet Need A Road Map?

Graph any equation below. (Let each space along the axes represent 1 unit.) The graph, if extended, will cross a letter. Look for this letter in the string of letters near the bottom of the page and CROSS IT OUT each time it appears. When you finish, write the letters that have NOT been crossed out in the rectangle at the bottom of the page.

1. $2x + 3y = 6$
2. $-x + 2y = 4$
3. $3x + y = -6$

4. $4x - 3y = 12$
5. $-3x - 5y = 15$
6. $2x + y = 5$

7. $x - 2y = -3$
8. $-3x + 5y = -10$
9. $x + y = 0$

PUSHAPNELAGONFSANTMCHIMEAPCRAWNGIFPHEANIYUN

ANSWER: [Blank]
**Did you hear about...**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>?</td>
</tr>
</tbody>
</table>

**DIRECTIONS:** Solve any system of equations below by graphing. Find the solution in the answer column and notice the word next to it. Write this word in the box that has the same letter as that exercise.

**KEEP WORKING AND YOU WILL HEAR ABOUT SOMEudder NONSENSE!**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| A | 2x + y = 5  
   | x - y = 4  
   |   |   |
| B | 3x + 2y = 12  
   | 2x + y = 7  
   |   |   |
| C | -2x + y = 5  
   | x - y = -3  
   |   |   |
| D | x + 3y = 4  
   | 2x - y = 8  
   |   |   |

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| E | 3x + y = -5  
   | x - 2y = 3  
   |   |   |
| F | -2x - y = 2  
   | x - y = 5  
   |   |   |
| G | 2x + y = -4  
   | x - 2y = -7  
   |   |   |
| H | x + 3y = 7  
   | -x + y = -3  
   |   |   |

**Solution:**

- **A** 2x + y = 5  
  x - y = 4  
  (3,4) — BEEF
- **B** 3x + 2y = 12  
  2x + y = 7  
  (-3,3) — UDDER
- **C** -2x + y = 5  
  x - y = -3  
  (2,3) — OLD
- **D** x + 3y = 4  
  2x - y = 8  
  (-3,2) — THE
- **E** 3x + y = -5  
  x - 2y = 3  
  (2,5) — GROUND
- **F** -2x - y = 2  
  x - y = 5  
  (-2,4) — HER
- **G** 2x + y = -4  
  x - 2y = -7  
  (-1,2) — FINALLY
- **H** x + 3y = 7  
  -x + y = -3  
  (0,1) — STOPPED

**Additional Words:**

- (-2,1) — COW
- (3,-1) — THE
- (-1,0) — MADE
- (1,-4) — KICKED
- (4,0) — WHO
- (-1,-5) — MOO
- (4,-2) — FARMER
- (4,1) — BUCKET
- (1,1) — MILK
How Do Fish Go Into Business?

Graph any inequality below. Then read the three statements that appear under the coordinate grid for that exercise. Circle the letter of the statement that correctly describes the location of the graph. Write this letter in each box at the bottom of the second page that contains the number of that exercise.

1. $x + y > 2$
   - Quadrants I, III, IV; includes boundary line.

2. $x + y \leq 2$
   - Quadrants I, II, IV; includes boundary line.

3. $2x - y \geq 4$
   - All four quadrants; includes boundary line.

4. $-2x + y < 4$
   - All four quadrants; excludes boundary line.

5. $x + y \geq -3$
   - All four quadrants; excludes boundary line.

6. $3x - 2y \leq 6$
   - All four quadrants; includes boundary line.

K
O
U
M
V
G
F
P
E
B
H
R
L
S
T
C
J
D

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7. $3x + 2y > 6$
   - Quadrants I, II, III; includes boundary line.

8. $-x + 4y < -4$
   - All four quadrants; includes boundary line.

9. $2x - y < -3$
   - Quadrants I, II, IV; includes boundary line.

10. $x + 2y \leq 5$
    - All four quadrants; includes boundary line.

11. $-3x - 4y > 12$
    - Quadrants II, III, IV; includes boundary line.

12. $x - y \geq 0$
    - Quadrants I, III, IV; includes boundary line.
Test of Genius

1. Arrange the numbers 1 to 8 in the circles so that no two consecutive integers are in circles that are connected by line segments.

2. Write a 10-digit numeral such that the first digit tells how many zeros there are in the entire numeral, the second digit tells how many ones there are in the numeral, the third digit tells how many twos, and so on.

```
0s  1s  2s  3s  4s  5s  6s  7s  8s  9s
```

3. Four old friends meet. If each one shakes hands with each of the others, how many handshakes are there altogether?

4. Two cars are traveling in the same direction on a road. The car that leads is traveling at 46 miles per hour. The other car is traveling at 70 miles per hour. How many miles apart will they be 30 minutes before the faster car catches the slower one?

5. An ancient ruler often condemned to death the people he no longer favored. However, he amused himself by giving his victims a chance to live if they were both clever and lucky.

   The victim was given 6 vials filled with poison, 6 vials filled with water, and 2 boxes. He was to arrange the 12 vials in the 2 boxes. He could put any number he liked in each box, but he had to put at least one vial in each. After he had put all the vials into the boxes, the ruler would first select one of the boxes and then draw out one vial from that box. The victim would have to drink its contents.

   What arrangement of vials in the boxes gives the condemned man the best chance of avoiding the poison?

6. Write a numeral with 6 nines whose value is 100. No operation symbols may be used, but a decimal point or fraction bar may be used.

7. What is special about this pattern of letters? Why are the letters arranged this way? (Hint: it has something to do with numbers.)

```
O T T F F S S E N T
E T T F F S S E N T
T T T T T T T T T T
F F F F F F F F F F
S S S S S S S S S S
S S S S S S S S S E
E E E E E E E E E E N
N N N N N N N N N N N N
```

SCORING KEY
6 or 7—Superstar Genius
4 or 5—Star Genius
2 or 3—Genius
0 or 1—Genius of the Future
SOLUTIONS

Page 2
Someday my prints will come
S - 1 1/2
S - 2 3/4
E - 1.5
D - 2.75
A - 1.25
Y - 1/2
M - 1/4
P - 0.5
R - 2 1/3
I - 1
N - 2 1/8
T - -2 7/8
S - -0.33
W - 2.33
I - 1 3/8
L - 1 2/3
C - 0.75
O - -0.75
M - -7/8
E - 0

Page 3
Greater than 4
5, 9/2, 8
Less than -2
-3, -7, -5/2
Greater than -1/2
0, -1/4, 5
Less than 5 1/2
10/2, -10/2, -1/3
Greater than -7 1/3
-7, -1/3, 0
Less than -1
-3/2, -5, -2 2/3
Greater than 0
15, 7/8, 3 1/3
Selling coffee is a grind

Page 4
You may wish to contrast the graph of a number with an arrow representing that number. While the graph has a unique location on the number line, the arrow can start at any point on the line.

Page 5
E 3 H -3
C 2 S 1
I 5 E 3 1/2
R -5 R -4 1/4
O -3 N 9
E 6 S -7
O -4 W -5 1/2
N 4 P 8
E 7 N 5 1/2
A -1 T -6 3/5
N -6

When anyone is a tenor

Page 6
Mosquito showing a girlfriend his most recent job
H -75 U -56
D -85 B -900
C -96 N -952
G -109 J 823
L -142 R -800
T -35 I -6
W -54 S -72
F -259 Q -179
E -226 O -89
A -323 M -101

Page 7

DECODE DESIGN: PAGE 1

DIRECTIONS: Each arrow diagram on page 7 represents a number sentence. Find the number sentence for any of these diagrams in the answer columns below. Notice the CIRCLE DESIGN next to the answer.

Find the CIRCLE DESIGN of your answer in the circle at the bottom of the page. Each time it appears, write the letter of the arrow diagram above it.

KEEP WORKING AND YOU WILL DECODE A SONG FOR SAIL!

Page 8

We love the wind
We love the sun
Sailing a boat
Is yachts of fun
13. -7 31. -3
14. -13 32. -17
15. -18 33. -7
16. -6 34. -3
17. -7 35. 5
18. -13 36. -4
19. -4 37. 3
20. 7 38. -3
21. -15 39. 2
22. 4 40. -15
23. 3 41. -13
24. -7 42. -7
25. -1 43. 4
26. -3 44. 7
27. 2 45. -6
28. -3 46. 8
29. 2 47. -4
30. 3 48. 7
An electric dishwasher gets you out of some tough chores

Page 10
Just fine tanks
A bout to improve
Worse dis year
Class y
I -22
B 26
V -83
E 50
M 49
K -47
A -78
D -257
W -19
J 30
U 37
F -37

Page 9
1. -6 7 3
2. 14 8 7
3. -4 9 0
4. -8 10 4
5. -4 11 -10
6. 4 12 0

PRE-ALGEBRA WITH PIZZAZZ!
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Page 28

World’s greatest lover of fractions

Page 29

A golden retriever

A Yankeeahahaha

Ten sows and bucks (ten thousand)

Page 30

Regrouping is not necessary for this puzzle.

Page 31

1. -6 7/12
2. 9 11/20
3. -4 1/3
4. 2 3/8
5. 1 8/15
6. 9 7/30
7. -9 1/36
8. -9 1/10
9. -6 17/24
10. -4 1/2
11. -4 19/35
12. -3 13/20
13. 5 7/24
14. 5/16
15. 7 31/40
16. 5/12

They curl up and dye

Page 32

1. 1 1/6
2. -3 7/30
3. -4 19/30
4. 8 5/18
5. 7 29/60
6. -5 27/40
7. 6 13/20
8. -2 3/8
9. 5 17/24
10. -11 24/12
11. 5 7/24
12. -6 31/48
13. -9 5/18
14. 9 11/36
15. 3 12/2
16. 5 10/12
17. 1 9/10
18. 4 23/30
19. 1/8

Kids with mumps have a swell time

Page 33

These problems are of three types. They require the student to compute one of the following: 1) the value of some variable after a gain or a loss (1, 2, 9, 12); 2) the difference between two values (3, 5, 7, 11, 13); 3) a net change (4, 6, 8, 10).

1. 45 1/2 degrees C
2. $37
3. 1104 yards
4. $24,300
5. 67 1/2 meters
6. -8
7. 6 5/6 hours
8. 1 2/3 yards
9. -26 degrees C
10. +2 1/8 points
11. 22 1/5 cm
12. 1723 meters
13. 307 1/2 meters

Many shop teachers do not believe in stone because they never saw it

Page 34

1. -6 7/12
2. 9 11/20
3. -4 1/3
4. 2 3/8
5. 1 8/15
6. 9 7/30
7. -9 1/36
8. -9 1/10
9. -6 17/24
10. -4 1/2
11. -4 19/35
12. -3 13/20
13. 5 7/24
14. 5/16
15. 7 31/40
16. 5/12

They curl up and dye

Page 35

N 12 E 23
I 7 H 15
E 17 H 1
D 10 A 11
A 25 N 29
Y 28 E 9
H 32 E 9
A 4 S 24
E 19 W 3
E 27 R 16
D 13 D 28
A 29 H 6
T 21 M 26
S 5 R 8
D 18 F 14

He was hired and fired on the same day

Page 36

L 5/4 S 10/23
H 2 C 1
Y 11/3 I 4/71
M 2/25 V 10/9
O 8/15 U 8/37
E 1/10 A -7/47
P 3/100 R 3/50
G 9 W -5/47
K -12/43 T 7/3

Very clumsy tightrope walker

Page 37

Miss Keeton

Candy Livingston

Rufus Caving

Page 38

Men, get in the boat

Long time, no sea

I’d rather fly a kite

Page 39

S -6/7 V 3/8
C 3/5 X 9/2
Y -15/14 U -2/21
A 33/26 N -1/10
E -20/21 L -2/9
D -4/9 P 12
T 10/3 H 3/7
G 2/9 R 35/2
I -33/8 F -7

Hugh and only Hugh can prevent florist fiascos

(You and only you can prevent forest fires)

Page 40

Y -1 1/2 F -7/20
O 1 1/5 K 3
S -2/3 R -21/62
E -5/9 K -3
O -4 2/3 T 1 1/2
R 11/27 S -1/7
R -9 1/2 B 40
C -7 7/8

For stocky brokers

Page 41

I W (I double you)

Page 42

1. -7/15
2. -1/5
3. -9/28
4. 2 1/4
5. -2 7/12
6. -2 1/2
7. 3 1/3
8. -5
9. 5 11/24
10. -4 7/30
11. 7 4/5
12. -36
13. 5 11/36
14. -4 3/8
15. -1
16. 5 5/7
17. 4 9/20
18. 1 3/5
19. 1

I W (I double you)

Page 43

1. 1 7/8
2. 18 7/12
3. 2 3/5
4. 4 2/5
5. 4 1/5
6. 27 3/8
7. 2 5/6
8. 9 1/3
9. 27
10. 1/10
11. 24
12. 8400

He had a suit tooth (sweet tooth)
Page 61
You may prefer to use these questions on a different time.
1. 28
2. $200
3. 4 brothers, 3 sisters
4. 1
5. Too much; he would earn more than $10,000.
6. 24
7. Larry
8. 
9. Top row; it includes all the letters having no curved lines.

Page 62
Caution students NOT to connect the last point in each group of problems to the first point in the next group. Also, you might suggest that students use a ruler to connect the dots.
1. 49
2. 16
3. 36
4. 1/9
5. Lift pencil
6. 1/1
7. 2
8. 1.000
9. 5
10. 0.00001
11. 0
12. 0
13. 0.001
14. 10
15. 10,000
16. 5.2
17. 0.0000001
18. 1
19. 10
20. 0.0000001
21. 0.00000001
22. 0.01
23. 0

Page 63
1. A
2. R
3. S
4. E
5. A
6. E
7. T
8. A
9. H
10. F
11. 2
12. 2
13. 2
14. 2
15. 1
16. 1
17. 0
18. 5
19. 1
20. 1
21. 1
22. 1
23. 1

Page 64
1. U
2. V
3. W
4. X
5. Y
6. Z
7. A
8. B
9. C
10. D
11. E
12. F
13. G
14. H
15. I
16. J
17. K
18. L
19. M
20. N
21. O
22. P
23. Q

Page 65
Why Did The Farmer Open A Bakery?
To answer this question, circle with colored pencil a single letter of 12 or 8.
Draw a straight line connecting each letter with its answer. Each line will cross a number next to it. The number tells you how far to move in the row or column at that point. If you want to answer the answer, make sure that you circle with colored pencil the correct answer.

Page 66
1. 1000
2. 0.001
3. 0.00000001
4. 100
5. 1,000,000,000
6. 100,000
7. 1
8. 0.001
9. 0.0000000001
10. 0.00000000001
11. 0.001
12. 0.0001
13. 10
14. 10,000
15. 0.0000001
16. 0.01
17. 0.1
18. 0.001
19. 0.0001
20. 0
21. 1
22. 0

Page 67
A nervous manor
Knight gown
Breath analyzer
W 10^5
A 10^-11
I 10^5
Z 10^-1
O 10^-3
S 10^-6
L 10^2
H 10^-5
Y 10^-7
E 10^-9
K 10^-9
V 10^-9
F 10^-12
S 10^-2
L 10^-7
G 10^-13
R 10^-4
N 10^-4

Page 68
1. 76,009
2. 5,000,480
3. 46.3
4. 2050.071
5. 40,000,822
6. 5,000
7. 700,060,009
8. 20,5071
9. 4006.000036
10. 4.0802

Page 69
Fortune tellers have a lot on the ball
The absent minded eye doctor who fell into his lens grinding machine and made a spectacle of himself
A 0.9
D 61.08
G 77.005
J 0.00973
M 6.0005
P 3.7
B 0.775
H 50.6
K 14.0805
N 18.00201
Q 0.043201
R -0.37
C 0.084
F -0.4954
I -0.00004
L -0.000065
O -0.007
R -9.007

Page 70
0.4 E
-2.47 H
76.084 T
5.9002 Y
-4.1 E
98.500 H
-0.76 V
7.80 A
56.0 O
0.050 W
0.7476 W
9.00 E
-40.0 T
-60.009 F
1.00 L
75.18 E
-60.000 T
10.00 E
10.0 F

Page 71
They have two left feet

Page 72
You might wish to point out to students the pattern in problems 8, 9, and 10. For a special challenge, ask students to find the decimal equivalent of 1/81. (Answer: 0.012345679.)
1. 0.3
2. 0.5
3. 0.83
4. 0.46
5. 0.415
6. 0.428571
7. 0.48
8. 0.09
9. 0.18
10. 0.27
11. 0.185
12. 0.076923
13. 0.135
14. 0.5

Page 73
People who make pillows really have to know their stuff
1. 0.66 2/3
2. 0.12 1/2
Page 76
1. E  7. M  
2. S  8. A  
3. H  9. N  
4. O  10. I  
5. K  11. L  
6. T  12. W  
A lion that makes its own wine

Page 77
The price of beef is getting so high these days that many hot dog makers are finding it very hard to make both ends meet (both ends meat).

Page 78
Before doing this puzzle, students may need practice changing answers like 15.75 × 10⁻³ back to scientific notation.

Page 79
The two guys who robbed a music store and got away with the lute (the loot)
A 3 × 10⁴  
B 4 × 10⁻⁶  
C 2 × 10⁻⁵  
D 1.2 × 10⁻²  
E 1.5 × 10¹⁰  
F 5 × 10⁵  
G 8 × 10⁻²  
H 3 × 10⁴  
I 4 × 10⁻⁷  
J 5 × 10⁻¹  
K 2 × 10¹⁰  
L 5 × 10⁷  
M 2.6 × 10⁸  
N 2 × 10⁵  

Page 80
1. 2.8 × 10⁻⁷  
2. 6 × 10⁻³  
3. 1.5 × 10⁻⁴  
4. 1.6 × 10⁻²  
5. 3 × 10⁻¹  
6. 1.6 × 10⁻⁵  
7. 3.6 × 10⁻⁷  
8. 4 × 10⁻¹  
9. 2.8 × 10⁻¹  
10. 4 × 10⁻¹  
11. 2 × 10⁻²  
12. 4 × 10⁻²  
13. 3 × 10⁻³  
14. 6 × 10⁻⁸  
15. 2 × 10⁻³  
16. 3 × 10⁴  
17. 1.5 × 10¹⁰  
18. 2.5 × 10⁰  
U. R. A. U. M. B. N. (You are a human being)

Page 81
The last number is the first 20 decimals of pi.
Rational: MAIDMAMA
 Irrational: ARRIEDAHOOD
Maid Marion married a hood (Robin Hood)

Page 82
1. O  8. D  
2. G  9. L  
3. E  10. M  
4. K  11. S  
5. T  12. N  
6. W  13. C  
7. I  14. A  
Making a long distance call (call)

Page 83
S 1/3  W 3/14  
N 8/1  T 1/6  
Y 3/5  L 8/3  
K 3/2  U 2/9  
F 3/7  H 60/13  
E 4/1  D 4/7  
I 2/5  A 72/127  
R 9/8  O 59/77  
G 5/4  C 19/26  

Crocodiles are always looking for a handout

Page 84
1. 9  11. 2  
2. 15  12. 3  
3. 8  13. 1/2  
4. 35  14. 3/1  
5. 32  15. 2/3  
6. 24  16. 3/5  
7. 14  17. 1/6  
8. 50  18. 2/3  
9. 60  19. 9/11  
10. 21  20. 7/8  
Ruth rode on my motorbike
On the seat in back of me
I took a bump at fifty
And rode on ruthlessly

Page 85
A 24  N 350  
R 12  A 6  
B 10  K 13/1  
O 7  H 11/5  
E 13/3  T 800  
I 2 1/2  T 18/23  
J 7 1/7  C 30  
E 4 2/5  V 1/33  
U 6 1/3  M 1/2  
A 4 5/7  T 1 3/5  
Take a thumb vacation (summer vacation)

Page 86
1. 225  
2. 210  
3. 30  
4. 50  
5. 11 1/5  
6. 266 2/3  
7. 1 1/2  
8. 3 3/4  
9. 24  
10. 6 1/2  
11. 15  
12. 2240  
13. 2 1/10  
14. 360  
HALO

Page 87
(Since you are) Such a fantastic math student you will love working with percents
H 35%  N 83%  
R 40%  I 74%  
F 150%  C 200%  
Y 375%  E 300%  
D 4%  P 1.1%  
G 97.5%  A 0.11%  
L 1%  U 11%  
V 1/2%  W 50%  
K 19%  S 500%  
M 65%  

Page 88
A nervous wreck
The king obe (of beasts)
Lorg distance
C 1/5  U 3/2  
O 1/2  W 5/4  
A 3/20  D 1/3  
H 67/100 N 1/200  
S 9/25  Y 5/2  
G 3/4  L 1/25  
I 3/10  R 2/3  
T 2/5  B 1/300  
K 1/100  E 1/50  

Page 89
1. CO  
2. M  
3. PAS  
4. SE  
5. SA  
6. REA  
7. L  
8. WAY  
9. SS  
10. OL  
11. DW  
12. IT  
13. H  
14. COMPLET  
16. EDI  
17. ION  
18. S  
Compasses are always sold with complete directions

Page 90
Clock for telling what time it was
E 70  I 7  
N 26  S 1.5  
O 45  F 4.25  
A 7  M 2.5  
G 84  C 72.3  
R 40  W 167  
H 2  L 230  
K 15  T 190.5  

Page 91
You might suggest that student's use 1%, 10%, 50%, 100%, 150%, and 200% as benchmarks to aid in estimating. The authors have found that this puzzle makes a good activity for the overhead projector.
1. H 12. H
2. E 13. A
3. T 14. T
4. I 15. I
5. S 16. O
6. U 17. H
7. T 18. N
8. E 19. W
9. G 20. D
11. S 22. D

She thought it was devine (the vine)

Page 92

Gets the picture
Can save your life
Will go out on a limb
G 71% C 77%
N 38% A 117%
U 22% D 144%
M 83% O 173%
S 67% E 233%
Y 42% H 248%
W 6% P 8%
R 53% T 9%
V 88% L 7%
B 24% I 3%

Page 93

1. 91.7 8. 114.0
2. 59.4 9. 269.3
3. 40.7 10. 385.9
4. 6.3 11. 0.8
5. 87.0 12. 0.6
6. 1.2 13. 0.1
7. 133.3

Jumping to a conclusion

Page 94

5 E 17 A
10 H 7 I
16 O 2 N
20 S 19 I
14 A 11 E
24 D 6 N
3 O 18 F
13 E 9 W
1 A 22 R
8 S 4 V
23 E 15 L
12 R 21 B

An oven is where a loaf is bred (bread)

Page 95

1. 14.49
2. 7.99
3. 63.75
4. 19.948
5. 1.66
6. 2.052
7. 0.316
8. 0.6955
9. 0.21875
10. 5.4027
11. 33.75
12. 0.76
13. 7.404
14. 0.0154
15. 129.995

Smoky the Bear has a furry godmother (fairy godmother)

Page 96

R 26.25
E 1750
R 2550
A 61,500
D 2261

Why Do Lovers Go to Horror Movies?

1. Q's are weird O's
2. Two's company and three's a cloud (a crowd)
3. Cannonballs are big shots
4. Students might be interested to know that in the election discussed in problem 2, the candidate with the most popular votes (Cleveland) lost the election.
5. O 6.416
6. G 6.16
7. Q 4.68

Page 97

D $45 M $53.91
E $33.75 A $61.95
U $88 L $52
W $84.15 O $50.97
H $47.70 R $56.07
Y $35.10 P $65.36
N $92.40 T $54.34
S $89.20 C $53.52

Page 98

Q 30 A 175
U 200 T 66 2/3
D 300 H 12
F 400 R 20
W 150 B 6

Page 99

The five states referred to in problem 13 are: Alaska, North Dakota, Nevada, Wyoming, and Hawaii.
1. 81 1/4
2. 41 2/3
3. 137 1/2
4. 2 2/9
5. 21 7/8
6. 83 1/3
7. 300
8. 166 2/3
9. 80 20/21
10. 86 2/3
11. 77 1/3
12. 133 1/3
13. 90%
14. 66 2/3%
15. 4 1/2%

Page 100

The bank robber who stepped on a scale and got a weigh
A 20%
B 12 1/2%
C 60%
D 13 1/3%
E 25%
F 22 2/9%
G 50%
H 33 1/3%
I 150%
J 41 2/3%
K 3 1/4%
L 225%

Page 101

The Wrong Brothers
He came in sickened (second)
A 300
D 800
T 2275
H 40
G 134
M 3080
W 50,000
V 15
S 6
K 120
O 30,000
B 25
N 3500
C 2000
E 400
R 350

Page 102

Two elephants not on speaking terms
O 11.96 M 24
R 30 W 6.9
L 72 N 85
S 20.4 K 12
I 75 E 11.9
H 50 P 89
A 11.9 T 99
G 4

Page 103

Sluggish
Knot bad
Fare, just fare
Really a drag
H 200 Y 24
U 780 J 18
B 130 D 198
E 75 R 70
I 50 N 90
O 60 G 25
L 72 A 40
K 36 S 100

Page 104

A four loaf cieaser (four leaf clover)

Page 105

An unlisted banana

Page 106

K 196 C 44
Y 45 L 7 1/2
O 200 V 90
A 4.48 H 0.88
X 16.23 T 175
I 52 W 300
S 144 E 2.25
D 53 1/3 P 12 1/2
R 450 N 1.75

Hotel workers are very inn-experienced

Page 107

1. 20.9 kilograms
2. 2%
3. $7500
4. 200 meters
5. 35.03 kilometers per second
6. 65%
7. 158%
8. $250,000
9. 23 1/3%

A four loaf cieaser (four leaf clover)

Page 108

1. N 7. X
2. U 8. S
3. A 9. V
4. W 10. E
5. H 11. R
6. O

He was a nervous Rex (nervous wreck)

Page 109

1. 1/2 9. 1/3
2. 1/2 10. 1/4
3. 50 11. 5/1
4. 1/6 12. 1/5
5. 1/6 13. 1/5
6. 1/6 14. 2/5
7. 15 15. 25
8. 512 16. 30

Be a little boulder

Page 110

E 1/3 H 3/10
T 1/4 L 7/10
I 5/12 A 2/5
E 1/12 Y 1/5
L 7/12 S 1/10
E 3/4 H 9/10
S 1/2 F 3/5
R 1/6 H 4/5

They are shellfish (selfish)

Page 111

E 3/10 T 1/4
N 1/2 A 3/4
A 1/10 N 1/12
I 7/10 U 11/12
A 5/12 A 6/13
N 3/3 S 5/13
D 1/6 B 1/13
N 7/12 L 10/13

An unlisted banana
Pages 112–113
Unlike most puzzles, this mini-program provides instruction as well as practice. For maximum benefit, students will need to read and study it several times.

1. L 20
2. P 15,600
3. R 15,120
4. C 9240
5. E 9000

Icicles are eavesdroppers.

Page 117
For a special challenge, have students find the number of different 5-card poker hands that can be dealt from a 52-card deck (Answer: 2,598,960).

R 10 G 5
O 6 I 56
E 15 P 36
T 21 F 35
L 1 C 70
D 84 H 126
N 20 A 45
S 28

Coin flippers can get a head.

Page 118
You may prefer to use these questions one at a time.

1. 4
2. Tom, manager; Dick, teller; Harry, cashier.
3. Start with the two boys crossing, one staying on the other side, the other returning, and continue from there.
4. Fido.

Page 119

<table>
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<td></td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5 1 12 8

6. One solution:

Page 123
1. N 8 W
2. C 9 R
3. E 10 H
4. G 11 U
5. A 12 L
6. I 13 S
7. K 14 P

He was pressing his luck.

Page 124
The third figure in this puzzle can be used to prove that the angle measures of a triangle add to 180°. The fourth figure can be used to show the relationships among the angles of a parallelogram.

1. 135° 12. 110°
2. 135° 13. 40°
3. 45° 14. 140°
4. 45° 15. 55°
5. 45° 16. 55°
6. 45° 17. 85°
7. 110° 18. 115°
8. 110° 19. 65°
9. 110° 20. 65°
10. 70° 21. 115°
11. 70°

It operates on batteries.

Page 125
T IS
U M H C
O T O L D
O H S W
E H T M
T O U E I D T

It is much too cold to wash them out (outside).

Page 126
1. polygon
2. quadrilateral
3. pentagon
4. angles
5. octagon
6. decagon
7. scalene
8. isosceles
9. equilateral
10. right
11. parallelogram
12. rectangle
13. trapezoid
14. rhombus
15. square

Clothes dryers hang up.

Page 127
T circle
I center
S radius
U chord
H diameter
T half
E central angle
I arc
S 110°
H 250°
L 210°
O 30°
D 330°
M minor arc
G major arc

Disguise the limit.

Page 128
1. 35° 13. 90°
2. 145° 14. 270°
3. 80° 15. 90°
4. 80° 16. 180°
5. 35° 17. 100°
6. 325° 18. 80°
7. 145° 19. 80°
8. 215° 20. 100°
9. 90° 21. 260°
10. 23° 22. 280°
11. 67° 23. 260°
12. 293° 24. 180°

You are closer to the ceiling.

Page 129

Page 130

Page 131

Page 132

Page 133

PRE-ALGEBRA WITH PIZZAZZ! © Creative Publications
Page 134
Box containing thirty-five spare parts for a porcupine
O 19 U 130
E 8.6 F 200
Y 14.7 T 8
A 19 H 0.8
G 81 X 9.2
I 192 N 7.0
B 1.5 C 70
S 1.0 R 167
V 13.0 P 173

Page 135
The horse who wanted to be a big movie star but ended up doing bit parts
Page 136
1. 0.575
2. 5750
3. 470
4. 93,300
5. 80
6. 3591
7. 690
8. 0.8
9. 0.02005
10. 6.9
11. 4.7
12. 7.02
13. 0.00833
14. 200,500
15. 20
16. 436,660
17. 0.05
18. 2000
Parking tickets are fine things

Page 137
---What's White and Goes Up?  ---

Page 138
A 19.7 m
T 25.8 m
I 19.6 m
J 47.4 m
O 87.7 m
U 20.54 m
E 34.6 m
D 16.7 m
B 33.2 m
S 68.32 m
H 135.57 m
Y 10.3 m
N 16.7 m
R 50.8 m
G 50.9 m
The Grand Canyon is just gorgeous (just gorgeous)

Page 139
1. 12
2. 4.3
3. 27.3
4. 3.25
5. 16.3
6. 17.1
7. 4.1/4
8. 2.4
9. 2.75
10. 5.1/5
11. 4.9
12. 17.5/6
The car spangled spanner (Star Spangled Banner)

Page 140
1. 93.6 6 306
2. 12.64 7 4.61
3. 34.9 8 286
4. 7.4 9 3.29
5. 40
Magic is tricky business

Page 141
Why Did The Chicken Hit Her Egg
With An Axe?

Page 142
1. 26.25 m
2. 77.1 m
3. 47.4 m
4. 14.29 m
5. 80.8 m
6. 26.534 m
7. 75.36 m
8. 31.85 m
9. 30.34
WhackaKey (Waikiki)

Page 143
E 3
L uncertain
Y 2
S 4
H uncertain
A 6
N uncertain
H uncertain
E 2
I 4
D 1
G 3
O 6
V uncertain
T 5
A uncertain
G 4
E 1
T 5
R uncertain
L 3
D 5
B uncertain
N 4

Page 144
G H U
P Q D D
L K K K
J W
BB AA
KK LL
BB O N
F S
L Y
M Z
CC DD
I U T G
II II
C D DD
EE EE F
II JJ
AA A B
Y X KK
537037 (Upside down it reads, 18 holes.)

Page 145
A challenging assignment or class activity using this puzzle is to have students make up an original problem for which each computation provides the solution. In addition, you might discuss with students why each solution has the unit of measure that it has.

Page 146
H 39 F 25 1/2
L 22 1/2 Y 26
U 38 T 25
D 40 R 41 1/2
I 22 S 29
P 34 E 30
Sleep is the rest of your life

Page 147
1. 28 cm²
2. 35 cm²
3. 24 cm²
4. 30 cm²
5. 27.04 cm²
6. 66.7 cm²
7. 38.71 cm²
8. 49.95 cm²
9. 39.48 cm²
10. 46.02 cm²
11. 82.31 cm²
12. 47.35 cm²
A drill pickle (dill pickle)

Page 148
1. I
2. T
3. H
4. W
5. A
6. C
7. E
8. D
9. M
10. O
11. R
12. S
His mother said a cross word

Page 149
T 15 D 161.5
O 16 S 36.48
Y 18 B 20.92
A 17.5 C 0.281
G 24.5 L 155
E 27.2 H 1.125
I 4.86 P 0.875
N 0.11
A bicycle shop has things to pedal

Page 150
C and Y (Candy)
1. 22.9 m, 19.14 m²
2. 16.2 m, 8.25 m²
3. 5.8 m, 1.445 m²

PRE-ALGEBRA WITH PIZZAZZ! © Creative Publications
4. 26.3 m, 16.65 m²
5. 2.66 m, 0.3318 m²
6. 26.43 m, 27.99 m²
7. 16.7 m, 7.755 m²
8. 69 m, 67.5 m²
9. 21.75 m, 21.45 m²
10. 5 m, 0.7125 m²
11. 44.06 m, 41 m²
Page 151
The landlord who asked a knight to collect money from his tenants so he could see a sir come for rents (circumference)

Page 152
For question 2.C, you might also have students compute the distance from A to B around the circle. The answer is the same.
1. A 254.34 m²
B 69.66 m²
C 56.52 m²
2. A 7.056 m²
B 3.5295 m²
C 4.71 m
D 9.42 m
3. 2.7 cm
4. A 25.12 m
B 50.24 m²
C 163.52 m²
5. 2.3 cm
6. A 2.4 m
B 22.86 m
C 9174 m²
A V 8 R (aviator)

Page 153
L 24 F 75
G 45 I 630
N 60 B 480
R 56 Y 2640
D 36 H 2700
E 27 T 2700
O 64 A 336
U 48 P 300
W 72 S 340
Buying two and a half pairs of shoes

Page 154
1. 360.8 cm³
2. 288.45 cm³
3. 1071 cm³
4. 1.5 cm³
5. 244.3 cm³
6. 826.4 cm³
7. 5832 mm³
8. 3933 m³
9. 420 m³
10. 1.4 m³
11. 3369 kg
With a sixth sense stamp (six-cent stamp)

Page 155
1. 364.5 cm³
2. 199.2 cm³
3. 102.93 cm³
4. 2080 m³
5. 97.92 cm³
6. 590 m³
7. 367.95 cm³
8. 13,863 mm³
9. 110.7 m³
Abominable (A bomb in a bull)

Page 156
The first four exercises can be used to show the relationship between the volume of a prism and the volume of a pyramid.
1. 144 cm³
2. 48 cm³
3. 30.6 cm³
4. 10.2 cm³
5. 720 cm³
6. 30 cm³
7. 0.18 cm³
8. 170 cm³
A wise guy (wise guy)

Page 157
1. R 7
2. I 8
3. E 9
4. S 10
5. H 11
6. F 12
A vise guy (wise guy)

Page 158
A stuck up kid
Loch jaw (lock jaw)
Snappy answers
A raven maniac
(paving maniac)
1. 6 V 10
2. 6 E 10
3. 7 G 10
4. 8 F 10
5. 9 E 10

Page 159
The students take only makeup exams
She wanted to be on the safe side
1. S 5
2. U 6
3. I 7
4. H 8
5. A

Page 160
They can't keep their trunks up

Page 162
A \( \sqrt{100} \) G \( \sqrt{77} \)
O \( \sqrt{170} \) U \( \sqrt{233} \)
S \( \sqrt{200} \) H \( \sqrt{136} \)
N \( \sqrt{200} \) L \( \sqrt{136} \)
E \( \sqrt{269} \) F \( \sqrt{65} \)
T \( \sqrt{305} \) R \( \sqrt{77} \)
I \( \sqrt{225} \) D \( \sqrt{625} \)
M \( \sqrt{169} \)

Page 163
The farmer had no regard for the feeling of udders (of others)
1. D 12
2. V 13
3. C 14
4. E 15
5. G 16
6. A 17
7. S 18
8. O 19
9. T 20
10. U 21
11. F 22

Page 164
1. 130 cm³
2. 146 cm³
3. 80 cm³
4. 289 m²
5. 109 m²
6. 493 cm³
7. 3290 cm³
8. 97 m³
9. 15025 cm³
10. 876 m³

Page 165
1. \( \sqrt{95} \)
2. \( \sqrt{171} \)
3. \( \sqrt{100} \)
4. \( \sqrt{137} \)
5. \( \sqrt{100} \)
6. \( \sqrt{121} \)
7. \( \sqrt{144} \)
8. \( \sqrt{155} \)

Page 166
1. A \( \sqrt{95} \)
2. B \( \sqrt{95} \)
3. C \( \sqrt{105} \)
4. D \( \sqrt{105} \)
5. \( \sqrt{16200} \) feet
6. \( \sqrt{1275} \) m

Page 167
As a follow-up, you might ask students to express some or all of their answers as decimals. Also, have students confirm that each triangle has the Pythagorean property.

Page 168
L \( 0.574 \) T \( 0.174 \)
E \( 0.176 \) Y \( 60° \)
A \( 0.423 \) O \( 46° \)
I \( 0.347 \) T \( 55° \)
T \( 1.922 \) L \( 5° \)
A \( 0.643 \) R \( 37° \)
H \( 75° \) S \( 40° \)
T \( 0.819 \) H \( 259° \)
A \( 45° \) P \( 65° \)

Page 169
The farmer who gave his rooster the name Robinson because he crew so

Page 170
Jim Panzee
Hugo Furst
Annette Andajar
U \( 37° \) G \( 36° \)
I \( 23° \) R \( 34° \)
S \( 55° \) H \( 60° \)
E \( 29° \) F \( 15° \)
O \( 21° \) Z \( 77° \)
T \( 53° \) J \( 56° \)
S \( 62° \) N \( 45° \)
M \( 72° \) A \( 6° \)

Page 171
1. A 142.7
2. B 153.3
C 139.9

Page 172
Exercise 2 illustrates how an extreme value can influence the mean more strongly than the median. The last exercise illustrates that a mode need not be near the mean or median.

Page 173
Scaling the vertical axis for the second set of data is left as a problem for the student. You might have students construct a frequency polygon as well as a histogram for each set of data.

Page 174
They melted

Page 177
They have a physical fit
A small bee in a big hive
Page 175
1. O 7. A
2. I 8. R
4. E 10. T
5. H 11. S
6. U
Three seaic tourists
Page 176
25% D $155 A 90°
21% O $105 E 76°
14% T $70 I 50°
C 40% E $200 S 144°
15% A 8 oz W 54°
26% O 10.4 oz H 94°
32% T 12.6 oz K 115°
10% W 4 oz H 36°
9° 17% T 6.8 oz L 61°
N 100% S 360°
He wanted to blow his stack
Page 177
1. 108° 9. 65°
2. 75° 10. 40°
3. 83° 11. 90°
4. 61° 12. 72°
5. 32° 13. 36°
6. 86° 14. 119°
7. 148° 15. 18°
8. 22° 16. 25°
They were dropping like flies
Page 178
This puzzle may be used to illustrate that, when computing the central angle, it is sometimes easier to use the fraction and other times easier to use the percent of the total.
T 1/3 O 371/2% D 135°
W 1/12 N 8 13/12 I 30°
C 1/4 T 25% U 90°
N 1/8 S 12/12 D 45°
E 1/6 T 16 2/3% I 60°
L 8 25 O 32% N 115°
T 1/3 W 33 1/3% T 120°
O 21/100 K 21% F 75°
E 325 C 12% H 45°
S 160 D 1 23% C 6°
It doesn't know how to conduct itself
Page 179
You may prefer to use these questions one at a time.
1. 27
2. Mr. Black — brown
Mr. Brown — green
Mr. Green — black
They ended up in a tie
Page 181
A Case of Blackmail
Apricots
P 72 C 24
L 16 Q 38
G 14 K 35
U 45 E 6
W 20 M 84
I 99 R 27
H 15 B 41
O 13 T 7
Z 42 A 18
Page 182
S 17 T 8
F 5 E 16
G 28 H 1
I 15 T 20
O 23 C 9
T 29 L 3
A 13 P 24
Y 11 B 12
I 19 N 22
A 26 T 6
S 7 E 4
H 21 C 27
O 32 B 14
T 16 L 25
W 18 G 31
He left sixty babies with no place to go
Page 183
M 19 S 12
G -11 X -18
P 15 F -65
A 10 H 25
C -10 E -31
N -79 B 32
T 55 I 17
U -48 R 44
Running a rabbit farm is a hare raising experience
Page 184
5x
-2y
-3x
4y
8x
-10x
-16y
-11x
-8x
11x
-20x
11x
15x
17x
-3x
-8x
-4x
Page 185
A -11 H
B 12 S
E 13 A
S 14 N
G 15 L
U 16 R
L 17 E
A 18 R
L 19 G
I 20 A
He uses all his rain gear (reindeer)
Page 186
1. 43 10. 5
2. 6 11. 9
3. 14 12. 30
4. 16 13. 18
5. 23 14. 44
6. -20 15. -12
7. -51 16. 22
8. 34 17. 11
9. 17
Page 187
H 19 A 10
E 2 T 6
H 7 N 27
F 25 D 1
B 14 R 21
O 11 F 5
E 16 G 28
M 9 D 17
R 22 V 15
W 13 I 26
S 10 O 4
T 10 L
Page 188
A 10 R
B 11 H
E 12 N
Y 13 J
A 14 D
S 15 M
O 16 C
K 17 T
U 18 B
It he couldn't lack it anymore (take it)
Page 190
What Happened To The Owl Who Swallowed A Watch?
Page 191
H 19 A 10
E 2 T 6
H 7 N 27
F 25 D 1
B 14 R 21
O 11 F 5
E 16 G 28
M 9 D 17
R 22 V 15
W 13 I 26
S 10 O 4
T 10 L
Page 193
If a lady trips and falls the reason the her brother cannot help her is that he cannot be a brother and assist her too (and a sister too)
Page 194
A likely split
A walkie talkie
Organized grime
Page 198
You may want to have students show on a separate paper a proof that each of their answers is a solution.
1. 2 12 4
2. 2 13 7
3. 7 14 9
4. 4 15 2
5. 1 16 8
6. 2 17 3
7. 10 18 7
8. 5 19 8
9. 4 20 4
10. 3 21 3
11. 2 22 6
You peso much and you own it (pay so much)

Page 199
H 14 P 21
I 12 S 27
O 24 Y 64
U 13 C 84
W 11 N 43
L 25 M 17
A 34 E 42

The yarn is a sweet potato while the announcer is a common tater (a commentator)

Page 200
There are a lot of people in the world who are still trying to decide whether or not splitting the atom was a wise crack

Page 201
Fireproof used for false alarms
O 4 M 1
A 7 U 9
D 14 P 5
I 6 R 21
S 8 L 11
E 3 F 2

Two white rabbits in a snowstorm
I 11 H 12
M 2 R 25
A 15 W 17
O 13 B 4
E 7 T 30
D 24 S 6

Page 202
1. 14 9 42
2. 12 10 72
3. 28 11 60
4. 40 12 200
5. 24 13 198
6. 45 14 50
7. 39 15 180
8. 56 16 54

Page 207
You may wish to inte- grate the puzzles on problem solving (pages 213-220) with this puzzle and with the following puzzles on equations.
Each has a point
The Nobles Prize
His boss chewed him out
S 5 D 1
M 2 Y 9
T 7 P 8
U 12 C 18
N 4 F 3
A 10 O 7
W 6 B 14
I 3 E 5
K 15 H 4
L 6 R 11
Z 8

Page 208
A dumb criminal
In favor of the metric system
R 32 C 44
O 14 L 28
Y 36 F 5
E 4 T 180
B 8 D 45
A 50 V 19
N 72 S 18
U 21 I 40
H 6 M 63

Page 209
Sand
1. 3/5
2. 1 1/2
3. 21
4. 6
5. 4/7
6. 5/13
7. 2 1/4
8. 1/4
9. 2 2/3
10. 5
11. 20
12. 6 1/2
13. 12
14. 1 3/7
15. 3
16. 3 1/3
17. 60
18. 6
19. 3/4
20. 3 5/4
21. 2 1/7
22. 18
23. 8/9
24. -10

Page 210
Quarter that joined the March of Dimes
I 4 H -3
E -7 O -1
C 1 U -6
F 3 D 8
A 6 R 2
S -2 Q 18
N -4 T -5
J 7 M -13

Page 211
1. 3/5
2. 1/2
3. 2/3
4. 1/4
5. 5/12
6. 13/14
7. 10
8. 5 1/2
9. 7 1/2
10. 1
11. 7/15
12. 5 1/4
13. 4 5/6
14. 3/16
15. 1/5
16. 7
He had trouble getting a date

Page 212
You might suggest that students use a ruler to connect the dots. Blanks are pro- vided for the solutions, to help students avoid skipping a solution when connecting the dots.
1. 3 10 -14
2. 6 11 1
3. 4 12 -7
4. 2 13 3
5. 9 14 18
6. 13 15 -21
7. 5 16 -7
8. 8 17 10
9. 2 18 3

Page 213
Circular omelette under a beach umbrella
D 6 M 5
L -3 P -14
N 7 U 8
H 2 T 1
A -4 R -25
I 10 E -1
B -12 C -9

Page 214
F 19 T 6
H 7 G 11
E 27 A 4
I 14 I 21
S 22 T 2
It was the highlight of his career

Page 215
I 24 S 15
E 21 T 14
A -10 W 600
T -12 R 4200
Y 70 K 272
I 140 D 80
A 48 R 1800
T 453
It was a dirty trek (dirty trick)
Page 216
1. 8 9 8 -32
2. -4 9 6296
3. 11 10 27
4. 5 11 555
5. 54 12 96
6. -3 13 78
7. 16 14 119
They both have the same middle name
Page 217
1. 9 36
2. 11 33
3. 23 27
4. 14 24
5. 13 18
6. 8 17
7. 10 58
8. 15 27
9. 7 26
10. 32
11. 12
It's twirly (too early)
Page 218
1. 4 28
2. 8 21
3. 30 12
4. 29 28
5. 5 44
6. 93 20
7. 31 m, 44 m
8. 11 59
9. 24 6 15
10. 10 20 19
11. 4 36 39
12. 30°, 70°, 80°
When he's hanging by his teeth
Page 219
Eileen Dover
Rusty Hinges
Adaline Moore
L 3 I -7
V -2 Y 1

23. E
24. L
25. C

Chickens use fowl language
Page 224

Why Did They Try To Build A House On Orgo's Head?

Page 220
The famous rodeo rider who would do anything for a buck
A 3 G 4 9
B 11 H 5 8
C 5 I 10 10
D -2 J 1 3
E 7 K 8 2
F -4
Page 221
1. N 6 P
2. A 7 R
3. H 8 V
4. E 9 B
5. O 10 T
To prevent bat breath (bad breath)
Page 222
1. D
2. I
3. G
4. Y
5. A
6. H
7. R
8. L
9. S
10. U
11. N
12. F
13. O
14. P
15. W
16. E
17. M
18. J
He wondered why he was feeling so jumpy
Page 223
1. N
2. L
3. O
4. U
5. C
6. S
7. E
8. G
9. K
10. W
11. F
12. N
13. H
14. E
15. U
16. U
17. A
18. S
19. A
20. I
21. G
22. P

It was living on spins and needles (pins and needles)

Page 225
The cross-eyed college professor who seemed to have absolutely no control over his pupils
Pages 226
1. IF
2. AN
3. AX
4. DROPS
5. ON
6. YOUR
7. CAR
8. YOU
9. MIGHT
10. HAVE
11. AN
12. AX
13. DENT
(an accident)
Page 227
You may wish to have students express some of the intersections in the left column as compound inequalities using the word "and" (e.g. \( x \geq -2 \) and \( x < 3 \)) or, where appropriate, in compact form (e.g. \( x \leq 2 \) or \( x < 3 \)).
1. D 8 V
2. O 9 E
3. W 10 T
4. I 11 L
5. G 12 N
6. A 13 S
7. P

Page 228
You may wish to have students rewrite exercises 2, 4, 6, and 14 in compact form (e.g. \( x \leq -3 \leq x \geq 2 \)).
1. G 8 M
2. N 9 I
3. H 10 E
4. T 11 B
5. U 12 S
6. O 13 A
7. L 14 P

Someone eating alphabet soup
Page 230
I never knew we both lived on the same block
Page 231-232
Numbers are not printed along the x-axis and the y-axis, as it is felt students may benefit from doing this themselves. An overhead transparency of this page may prove helpful in getting students started.
Coordinate grids suitable for graphing these functions are provided on page 234.

1. 10 26 S 5 E 0 3 21 D 4 11 N 6 28 N 3 1 B 7 6 U 1 W 10 15 H 9 T

2. 3 32 L 0 12 E 4 29 A 6 28 N 3 1 B 7 6 U 1 W 10 15 H 9 T

Because he wanted to kiss behind the ears

Page 237

It is not intended that students graph these functions, but rather that they be exposed to a variety of more complex functions.

Page 235

They went three thousand miles on a gallon (on a gallon)

Page 239

L 6 R 13
F 15 V 5
A 10 O 16
U 3 M 7
T 12 H 17
E 18 B 2
S 8 I 14
Y 1 N 11
D 9 C 4

They could never find another man of his calibre

Page 240

Since the graph of each equation is a straight line, only two solutions are needed. The simplest solutions are of the form (x, 0) and (0, y).

Page 241

You may want to provide students with copies of page 233 (or print it on the back of this page) for graphing these systems of equations.

Page 242–243

1. 0
2. E
3. H
4. M
5. T
6. C
7. N
8. Y
9. L
10. R
11. A
12. S

They start on a small scale