Hello Mathematicians!

Enclosed you will find a number of worksheets to keep your brain growing during this homeschool experience. Pace yourself and strive to do about 30 minutes a day. Most of this material is review for you, things we have covered in class. The rest of the material may be new to you, but want to provide you with a challenge. Please know that if you have questions, we are here for you! You can reach us at our school email address.

To Reach Mrs. Owens: owens@kfschools.org

To reach Mrs. Boyd: pboyd@kfschools.org

We miss you a ton!
Stay Well!
### Books Never Written

- **What's That Smell?**
  - by 6 11.5 15 -9 17 3 13 7.6 -9 45 -11 17

- **Too Sick For School**
  - by -5.4 15 11 17 -14 -47 -27 16 -15

- **My Talking Alarm Clock**
  - by -9 32 45 -8.1 45 7 9.9 -6 21 16

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Find the solution in the code. Each time it appears, write the letter of the exercise above it.

<table>
<thead>
<tr>
<th>Equation</th>
<th>Letter</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>P ( x + 2 = 9 )</td>
<td>I ( n + 7 = -20 )</td>
<td>O ( 10 + y = 4 )</td>
</tr>
<tr>
<td>E ( q - 5 = 12 )</td>
<td>G ( d - 1 = -16 )</td>
<td>D ( -10 + y = 3 )</td>
</tr>
<tr>
<td>H ( 6 + m = 27 )</td>
<td>A ( b - 40 = -25 )</td>
<td>C ( -11 + x = -5 )</td>
</tr>
<tr>
<td>Y ( t - 14 = -3 )</td>
<td>M ( 18 + w = 7 )</td>
<td>K ( -13 + a = -60 )</td>
</tr>
<tr>
<td>J ( u - 7.5 = 2.4 )</td>
<td>L ( k + 8.3 = 19.8 )</td>
<td>F ( -5.2 + n = -10.6 )</td>
</tr>
<tr>
<td>N ( 21 = y + 5 )</td>
<td>R ( -12 = h - 3 )</td>
<td>U ( 7 = -38 + p )</td>
</tr>
</tbody>
</table>
What Do You Call It When a Royal Ruler Climbs a Mountain?

Solve, then cross out the letter above the solution. When you’re finished, the answer to the title question will remain.

1. \( n - 3 = 10 \)  
2. \( y + 8 = 15 \)  
3. \( 9 + x = 2 \)

4. \( d - 16 = -5 \)  
5. \( -6 + u = 22 \)  
6. \( a + 11 = -14 \)

7. \( 18 = k + 1 \)  
8. \( 7 = p - 12 \)  
9. \( -3 = b + 60 \)

10. \( 11 - (-x) = 44 \)  
11. \( -5 - (-m) = 92 \)  
12. \( y - (-27) = 4 \)

13. In 3-way light bulbs, the highest wattage is the sum of the two lower ones. If the lowest is 60 watts, and the highest is 150 watts, what is the middle wattage?

14. It was an extremely cold day on the mountain. The temperature dropped 22°F to -13°F. What was the temperature before the drop?

15. \( 3 + 8 + x = 50 \)  
16. \( -7 + v + 15 = -2 \)  
17. \( 10 + q - 3 = 6 \cdot 5 \)

18. \( 3 \cdot 16 = -9 + k \)  
19. \( -8 = 12 + t - 5 \)  
20. \( 43 + 7 + x - 16 = 0 \)

21. \( d - \frac{1}{5} = \frac{3}{5} \)  
22. \( -\frac{3}{8} + n = -\frac{7}{8} \)  
23. \( \frac{2}{3} = b - \frac{1}{4} \)

24. \( x - (-30) = 100 - 9 \)  
25. \( 2m + 7 - m = -40 \)  
26. \( 0 = -3y - 10 + 4y \)

27. The sum of the angle measures of any triangle is 180°. If one angle of a triangle measures 35° and another angle measures 72°, what is the measure of the third angle?

28. The perimeter of this quadrilateral is 100 in. What is the length of the side not given?
**MOVING WORDS**

Solve each 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. You’ll get a “high five” for a high five.

<table>
<thead>
<tr>
<th>THE</th>
<th>TO</th>
<th>A</th>
<th>OF</th>
</tr>
</thead>
<tbody>
<tr>
<td>$11x = 99$</td>
<td>$-4x = 36$</td>
<td>$\frac{x}{5} = 8$</td>
<td>$\frac{x}{-3} = 12$</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>BECAUSE</th>
<th>WHO</th>
<th>HAS</th>
<th>FREE</th>
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</thead>
<tbody>
<tr>
<td>$-15x = -75$</td>
<td>$\frac{x}{-2} = -72$</td>
<td>$18x = 180$</td>
<td>$\frac{-x}{4} = 25$</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>THE</th>
<th>QUINT</th>
<th>CONGRATULATIONS</th>
<th>AIRLINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{x}{300} = -2$</td>
<td>$45x = -360$</td>
<td>$-\frac{n}{6} = 20$</td>
<td>$-12n = -144$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GOT</th>
<th>PROGRAM</th>
<th>TICKETS</th>
<th>MOTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>$42 = 14n$</td>
<td>$16 = \frac{n}{16}$</td>
<td>$490 = -7n$</td>
<td>$-50 = \frac{n}{-9}$</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PLANE</th>
<th>FREE</th>
<th>QUINTUPLETS</th>
<th>FLYER</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{-n}{80} = -30$</td>
<td>$25n = -1000$</td>
<td>$-\frac{n}{13} = 40$</td>
<td>$-99n = 0$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$n = -120$</th>
<th>$x = -9$</th>
<th>$x = -600$</th>
<th>$n = 450$</th>
<th>$x = -36$</th>
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</thead>
<tbody>
<tr>
<td>$n = -520$</td>
<td>$x = 144$</td>
<td>$n = 3$</td>
<td>$x = -100$</td>
<td>$n = 2400$</td>
</tr>
<tr>
<td>$n = -70$</td>
<td>$x = 5$</td>
<td>$x = 9$</td>
<td>$n = 12$</td>
<td>$x = 10$</td>
</tr>
<tr>
<td>$x = 40$</td>
<td>$n = -40$</td>
<td>$x = -8$</td>
<td>$n = 0$</td>
<td>$n = 256$</td>
</tr>
</tbody>
</table>

Equations and Problems:
Solving One-Step Equations: Multiplication or Division

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3.3
Famous Honolulu Keyboarding School

Cross out the letter pair next to each correct solution. For each letter pair that you
DON'T cross out, write the uppercase letter in the box containing the lowercase letter.

1  \(-5y = 80\)  2  \(-36 = -18d\)  3  \(9x - 6x = 36\)  4  \(49 \cdot 2 = 3a - 10a\)

5  \(\frac{w}{4} = -16\)  6  \(\frac{1}{4}b = 16\)  7  \(\frac{-1}{9}d = 12\)  8  \(-3 = \frac{-e}{75}\)

9  Ken is thinking of a number. The product of the number and 7 is -350. Find Ken's number.

10  Barbie has a favorite number. The quotient of her number and \(-4\) is \(-90\). What is Barbie's favorite number?

Answers 1-10  e\cdot F  -14  a\cdot S  -16  d\cdot R  225  c\cdot H  58  b\cdot J  64  n\cdot Y  -9
m\cdot V  -50  i\cdot A  290  j\cdot T  -108  g\cdot O  12  f\cdot D  360  i\cdot N  2  h\cdot P  -64

11  \(2.5x = -60\)  12  \(-\frac{1}{5}n = -14\)  13  \(70.5 = 9.4p\)  14  \(-20 = \frac{1}{16}y\)

15  \(\frac{2}{3}k = 10\)  16  \(\frac{3}{8}u = -15\)  17  \(7a = 35\)  18  \(-\frac{5}{16}t = -45\)

19  Argyle sells computers. He keeps one eighth of his sales as a commission. How much must he sell to earn $500?

20  The area of a TV screen is 576 square inches. If the width of the screen is 32 in., what is the height?

Answers 11-20  a\cdot S  -40  j\cdot C  70  e\cdot C  -50  h\cdot A  10  b\cdot R  18 in.  m\cdot E  $3600
d\cdot A  24 in.  f\cdot L  -320  k\cdot T  144  l\cdot G  15  n\cdot E  -24  g\cdot C  7.5  o\cdot N  $4000

21  \(-0.3m = -12\)  22  \(36 = -\frac{9}{5}d\)  23  \(x - 5x = 8^2\)  24  \(\frac{1}{6}y = \frac{1}{3}\)

25  \(-\frac{2}{5}w = -\frac{4}{15}\)  26  \(\frac{1}{2} = 8m\)  27  \(\frac{4}{3}b = -\frac{20}{3}\)  28  \(x - \frac{9}{10}x = 7\)

29  Lisa is 14 years old. Her age is two sevenths of her father's age. How old is Lisa's father?

30  Eon runs a music store. He sells CD's for 1.6 times what he pays for them. If Eon sells a CD for $15.20, how much did he pay for it?

Answers 21-30  h\cdot O  49  b\cdot W  \frac{3}{8}  j\cdot R  -16  c\cdot T  40  l\cdot D  2  g\cdot E  $9.50
k\cdot I  -20  a\cdot N  \frac{2}{3}  o\cdot S  -5  f\cdot H  \frac{1}{16}  f\cdot K  52  b\cdot S  70  l\cdot K  $8.80

Equations and Problems:
Solving One-Step Equations: Multiplication or Division

3.4
What Did Dr. Freud Say To the Guy Who Thought He Was Mickey Mouse One Day and Donald Duck the Next?

Solve the equation, then find your solution in the corresponding answer boxes. Write the letter of the exercise in the box containing the answer.

A  \(8 + x = 40\)  I  \(\frac{a}{5} = -16\)  O  \(y - 17 = -4\)

E  \(-9b = -99\)  G  \(-3 = k + 75\)  A  \(-\frac{1}{8}w = -13\)

N  \(-11 + m = 50\)  U  \(65 = 2x - 7x\)  H  \(10 - (-d) = 3\)

Y  \(\frac{4}{5}b = 12\)  R  \(15 + u - 22 = 9^2\)  V  \(9n = \frac{1}{4}\)

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\(\begin{array}{|c|c|c|c|c|c|c|c|}
\hline
15 & 13 & -13 & \frac{1}{12} & 32 & 88 & 11 & 75 & -7 & 104 & \frac{1}{36} & -80 & 61 & -78 \\
\hline
\end{array}\)

S  \(-5 = \frac{-a}{36}\)  E  \(p - (-1) = (-7)^2\)  L  \(30 = -12y\)

I  \(w - \frac{2}{9} = \frac{5}{9}\)  S  \(-\frac{5}{8}x = 30\)  Y  \(-2 \cdot 7 = -3 + t + 24\)

E  \(-4.5q = -32.4\)  S  \(-4c - 9.6 + 5c = 0\)  L  \(-\frac{3}{4}m = -\frac{9}{16}\)

D  \(18 = b + 5^3\)  P  \(n - \frac{1}{3} = \frac{2}{5}\)  N  \(8x - 9x = \frac{150}{10}\)

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Equations and Problems:
Solving One-Step Equations: All Four Operations

3.5

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How Much Did Captain Hook Have to Pay for His Earrings?

For each problem, label a variable (let $x$ = the unknown), then write and solve an equation. Find your equation in the column at the right. Write the letter of the equation in the box at the bottom that contains the problem solution.

1. Ben and Jerry together scored 50 points in the big game. If Ben scored 16 points, how many points did Jerry score?

2. Marble Middle School paid $500 for 16 graphing calculators. What was the cost for each calculator?

3. On first down, a football team lost 16 yd. After two downs, the team had an overall gain of 5 yd. How many yards were gained on second down?

4. One sixth of the candies in a bag of M&M's are orange. If there are 15 orange candies, how many M&M's are in the bag?

5. A scuba diver dove 16 ft to an elevation of $-50$ ft. What was her elevation before the dive?

6. The number of elephants at the circus was two fifths of the number of horses. If there were 16 elephants, how many horses were there?

7. A chest was resting on the ocean floor 500 ft below the surface. It was lifted to the deck of a ship 16 ft above the surface. How far was the chest lifted?

8. If you divide the age of Grampa Gump by 16, you get the age of Junior Gump. If Junior is 5 years old, how old is Grampa?

9. At Maxx Middle School, there are 30 times as many students as teachers. If there are 450 students, how many teachers are there?

10. Kodak cut a pizza into eight equal slices and ate three of them. If his meal had 450 calories, how many calories were in the entire pizza?

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<table>
<thead>
<tr>
<th>Problem</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>$30x = 450$</td>
</tr>
<tr>
<td>S</td>
<td>$x - \frac{1}{6} = 15$</td>
</tr>
<tr>
<td>E</td>
<td>$x + 16 = 50$</td>
</tr>
<tr>
<td>U</td>
<td>$\frac{2}{5}x = 16$</td>
</tr>
<tr>
<td>C</td>
<td>$-16 + x = 5$</td>
</tr>
<tr>
<td>G</td>
<td>$\frac{30}{x} = 450$</td>
</tr>
<tr>
<td>B</td>
<td>$\frac{3}{8}x = 450$</td>
</tr>
<tr>
<td>A</td>
<td>$16x = 500$</td>
</tr>
<tr>
<td>K</td>
<td>$\frac{x}{16} = 5$</td>
</tr>
<tr>
<td>A</td>
<td>$x - 16 = -50$</td>
</tr>
<tr>
<td>O</td>
<td>$x + \frac{2}{5} = 16$</td>
</tr>
<tr>
<td>N</td>
<td>$\frac{1}{6}x = 15$</td>
</tr>
<tr>
<td>L</td>
<td>$8x - 3x = 450$</td>
</tr>
<tr>
<td>A</td>
<td>$-500 + x = 16$</td>
</tr>
</tbody>
</table>

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Equations and Problems:
Solving Problems Using One-Step Equations

3.6
WHAT IS THE TITLE OF THIS PICTURE?

Find each solution in the coded title. Each time it appears, write the letter of the exercise above it.

**CODED TITLE:**

135  -65  -2  -98  -9  48  -14  -14  -2  7  -2  -8  105  
81   60  60  -17  104  48  -81  -3  -72  -81  60  5  135  48  7  -3  
48   122  11  -14  60  144  -8  -2  -8  105  43  144  -2  -81  -12  -65

V 5x + 8 = 43  A 2n - 15 = 81  C -9a + 4 = 112  N -3 + 10y = -83

O \( \frac{w}{4} + 7 = 22 \)  T \( \frac{x}{9} - 1 = -10 \)  L \( \frac{d}{-8} + 37 = 24 \)  P \( 11 - \frac{k}{2} = 60 \)

E -5 - 16y = 43  G \( \frac{-u}{7} + 2 = -13 \)  D 15 - 8m = -73  S \( \frac{1}{3} x + 10 = 55 \)

R 7t - 18 = -116  H \( \frac{1}{5} q - 4 = 9 \)  I 72 + 36n = 0  W \( 7 - \frac{1}{16} x = -2 \)
What Do You Get When You...

1. Cross a fast dog with a bumblebee?

-16  -12  30  315  2  36  -15  15  -42  -18  -40  44  56  -42  -5  -5

2. Cross an airplane with a magician?

-16  98  -2  7  36  -27  -18  30  295  8  15  315  168  2  315  2  315

Solve each equation or problem and find your solution in the code. Each time the solution appears, write the letter of the exercise above it.

-16  98  -2  7  36  -27  -18  30  295  8  15  315  168  2  315  2  315

S.  2 + 9n = 74
E.  -18y + 7 = -29
H.  11 - 4d = 71

C.  -8 + \(\frac{x}{7}\) = 16
I.  \(\frac{1}{3}p + 1\) = 10
U.  15 - \(\frac{w}{6}\) = 22

G.  \(\frac{2}{3}y + 8\) = 20
A.  -12 + 5k = -92
D.  \(-\frac{3}{8}x - 11\) = 4

F.  -28 = 13q - 2
O.  30 = 10 + \(\frac{4}{3}m\)
L.  -48 = -6y - 6

B.  8 - \(\frac{5}{7}x\) = -32
Z.  65 + 13t = 0
N.  100 = 1 - \(\frac{11}{2}n\)

Y.  Mr. Mustard said: "Eight less than three times my age is 100." How old is Mr. Mustard?

R.  You are a salesperson for Acme Toys. Every day you earn $30 plus two ninths of your sales. What dollar amount of sales do you need today to earn $100?
Why Did the Snorgs Name Their Only Daughter “Margarine”? 

Solve the equation. Write the letter of the answer in the box containing the exercise number. Then rearrange each set of letters to make a word.

1. \(2x + 3 = 12\)
2. \(6y - 5 = 11\)
3. \(-\frac{1}{8} d + 7 = 16\)
4. \(11 - \frac{a}{4} = 4\)
5. \(\frac{2}{3} k + 8 = 18\)
6. \(\frac{5}{2} x - 1 = -31\)
7. Karma's age is 2 years less than three eighths of her father's age. If Karma is 13 years old, how old is her father?
8. \(\frac{2}{3} w = 7\)
9. \(\frac{3}{4} x - 2 = 8\)
10. \(\frac{7}{2} m + 1 = -10\)
11. \(4 - \frac{8}{3} q = 19\)
12. \(-78 = 10b - 3\)
13. \(20 + \frac{4}{5} y = 8\)
14. Last week Kiwi filled his 16-gallon tank with gas. On the average, his car burns 0.03 gallon of gas per mile. If Kiwi has 4 gallons left in his tank, how many miles has he driven?
15. \(\frac{11}{4} p + 3 = 5\)
16. \(\frac{x}{18} + 8 = -2\)
17. \(6 - \frac{3}{7} h = 11\)
18. \(-4 = 12t - 13\)
19. \(80 + \frac{5}{16} y = 100\)
20. \(2n - 3n = \frac{2}{9}\)
21. The drawing shows a stack of paper cups. The cups are 10 cm high. Each cup after the first adds 0.8 cm to the height of the stack. How many cups will fit in a dispenser that is 30 cm high?

Answers 1-7:

L -10  D 40  H 2 2/3
O 15  T 28  R 36
E 4 1/2  T -12  Y -72

Answers 8-14:

H -5 5/8  S 360  N -15
N 10 1/2  V -7 1/2  E 13 1/3
B 3/4  S 36  T -11 2/3

Answers 14-21:

R -2/9  A 8/11  U -180
N 1 1/8  E 64  H 26

Rearrange each set of letters to make a word. Write the word in the set of boxes below.

Equations and Problems:
Solving Two-Step Equations

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3.9
### Did You Hear About . . .

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
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<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
</tbody>
</table>

Solve each equation or problem. Write the word next to the correct answer in the box that contains the exercise number.

1. $2n + 5 = 20$
2. $8y - 3 = -13$
3. $12 - 5b = 14$
4. $\frac{1}{4}m + 9 = -16$
5. $2 - \frac{x}{15} = -3$
6. $\frac{5}{8}a - 27 = -7$
7. $7x - 11 - 4x = 6$
8. $32 = y - 8 - 13y$
9. $-10 = -12 + \frac{4}{7}n$
10. $4 \cdot 9 = 30 - \frac{k}{16}$
11. $\frac{d + 8}{3} = -14$
12. $\frac{1}{5}p + \frac{9}{5}p + 6 = 30$
13. $\frac{4m - 7}{2} = 18$
14. $10 + x - \frac{1}{3}x = 0$
15. $5 = 15 - 24a$

**Answers 1-9**
- $\frac{2}{5} \cdot $WHO
- $-92 \cdot $TRIED
- $-3 \frac{1}{3} \cdot $BRAIN
- $32 \cdot $FROM
- $7 \frac{1}{2} \cdot $THE
- $-2 \frac{5}{6} \cdot $SLEEP
- $-100 \cdot $WOKE
- $28 \cdot $DREAMING
- $-1 \frac{1}{4} \cdot $GUY
- $5 \frac{2}{3} \cdot $HIS
- $4 \frac{1}{4} \cdot $SURGERY
- $75 \cdot $UP
- $3 \frac{1}{2} \cdot $TRANSPLANT

**Answers 10-17**
- $-90 \cdot $MISSING
- $10 \frac{3}{4} \cdot $HE
- $-\frac{5}{8} \cdot $CHANGED
- $-\frac{1}{4} \cdot $DECIDED
- $-96 \cdot $OPERATION
- $64 \text{ mi} \cdot $MIND
- $-48 \cdot $WITH
- $15 \cdot $SAID
- $62 \text{ mi} \cdot $INTO
- $-15 \cdot $HAD
- $57 \text{ mi} \cdot $HIS
- $72 \text{ mi} \cdot $SKULL
- $-50 \cdot $AND

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16. So far, 37 miles of a new highway have been completed. This is one mile less than two thirds of the entire length. How long will the new highway be when complete?

17. Buck rented a truck for $39.95 plus $0.32 per mile. Before returning the truck, he filled the tank with gasoline, which cost $9.80. If the total cost was $70.23, how far was the truck driven?
What Do You Call an Arrow With No Arrowhead?

Solve each problem and find your answer in the answer section. Look for the letter of the correct answer in the string of letters near the bottom of the page and cross it out each time it appears. When you finish, write the remaining letters in the space at the bottom of the page.

1. Jack is thinking of a number. Eight more than the product of 5 and the number is 93. Find Jack's number.

2. Jill is thinking of a number. Twenty less than one fourth of the number is -45. Find Jill's number.

3. Papa John is 50 years old. His age is 2 years more than 3 times the age of Jimmy John. How old is Jimmy?

4. Jennifer weighs 99 lb. Her weight is 5 pounds less than two thirds of her father's weight. How much does her father weigh?

5. The Backpacking Club is having some posters printed. The printer charges $180 plus $2.50 per poster. How many posters can be printed for $1000?

6. Zolox worked 38 hours last week. He had $88 deducted from his earnings for taxes. If he had $273 left after the deduction, how much does Zolox earn per hour?

7. Mega Middle School had a Valentine Dance. Four fifths of the students plus 7 teachers were there. If there were 495 people at the dance, how many students attend the school?

8. Romeo ordered a bouquet of roses for his girl friend. Each rose cost $2.95, and the delivery charge was $8.50. If the total cost was $61.60, how many roses did Romeo order?

9. The temperature in Frostport is 8°F and dropping at the rate of 3.5 degrees per hour. How many hours will it be until the temperature is -20°F?

10. Sky High School ordered two laser printers plus a supply of toner cartridges for them. Each printer cost $675, and each cartridge cost $80. If the total cost was $2310, how many cartridges were ordered?

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Equations and Problems:
Solving Problems Using Two-Step Equations

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3.11
Why Shouldn’t You Let a Doctor Put One of Those Wooden Sticks In Your Mouth?

Cross out the letters above each correct answer. When you finish, write the remaining letters in the spaces at the bottom of the page.

1. Ms. Gadget’s car broke down on the turnpike. Acme Towing charged $30 plus $3 per mile to tow the car. If Ms. Gadget paid $162, how far was the car towed?

2. Working as a waiter, Michael earns $6.50 per hour plus tips. Last night he received $36.50 in tips and earned a total of $65.75. How many hours did he work?

3. A banana has 80 calories. This is 5 calories less than one seventh of the calories in a banana split. How many calories are in a banana split?

4. The pressure on a scuba diver at sea level is 14.7 pounds per square inch (psi). The pressure increases 0.445 psi for each foot of depth. Suppose the pressure on a diver is 41.4 psi. How deep is she?

5. Mr. Kork sold his car for $8,400. This was $200 more than two fifths of what he had paid for the car originally. How much had Mr. Kork paid for the car?

6. A spring is 2 in. long with no weight suspended from it. For each ounce of weight, the spring stretches 0.3 in. until it reaches its maximum length of 8 in. How much weight must be added for the spring to reach its maximum length?

7. Jennifer lit a 12-inch candle and let it burn. She found that after each hour, the candle was \(\frac{3}{4}\) in. shorter. If she let the candle burn until it was only 1 in. tall, how many hours did it burn?

8. As an airplane rises, the outside temperature drops 3.6°F for each 1000 feet of elevation gain. Suppose the outside temperature is 75°F on the ground and -51°F at cruising altitude. How high is the plane at cruising altitude?

9. Snorkel and two friends rented three life jackets and a sailboat. The life jackets were $3 each and the boat was $12 an hour. The total cost was $81. For how many hours did they rent the sailboat?
Why Shouldn't You Let a Doctor Put One of Those Wooden Sticks in Your Mouth?

Cross out the letters above each correct answer. When you finish, write the remaining letters in the spaces at the bottom of the page.

1. Mr. Gadget’s car broke down on the turnpike. Acme Towing charged $30 plus $3 per mile to tow the car. If Mr. Gadget paid $174, how far was the car towed?

2. Working as a waiter, Michael earns $6.50 per hour plus tips. Last night he received $38.50 in tips and earned a total of $74.25. How many hours did he work?

3. A banana has 90 calories. This is 5 calories less than one seventh of the calories in a banana split. How many calories are in a banana split?

4. The pressure on a scuba diver at sea level is 14.7 pounds per square inch (psi). The pressure increases 0.445 psi for each foot of depth. Suppose the pressure on a diver is 32.5 psi. How deep is he?

5. Ms. Kork sold her car for $8,700. This was $100 more than two fifths of what she had paid for the car originally. How much had Ms. Kork paid for the car?

6. A spring is 3 in. long with no weight suspended from it. For each ounce of weight, the spring stretches 0.2 in. until it reaches its maximum length of 9 in. How much weight must be added for the spring to reach its maximum length?

7. Jennifer lit an 11-inch candle and let it burn. She found that after each hour, the candle was \( \frac{3}{4} \) in. shorter. If she let the candle burn until it was only 1 in. tall, how many hours did it burn?

8. As an airplane rises, the outside temperature drops 3.6°F for each 1000 feet of elevation gain. Suppose the outside temperature is 65°F on the ground and -43°F at cruising altitude. How high is the plane at cruising altitude?

9. Snorkel and two friends rented three life jackets and a sailboat. The life jackets were $3 each and the boat was $12 an hour. The total cost was $93. For how many hours did they rent the sailboat?

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<td>5.5 h</td>
<td>30,000 ft</td>
<td>54 mi</td>
</tr>
</tbody>
</table>

Equations and Problems:
Solving Problems Using Two-Step Equations (B)
1. $5x + 2(x + 4) = 64$
2. $9(y - 2) + 4 = 31$
3. $7 + 4(2a + 15) = -13$

4. $6(n - 5) - 11n = 0$
5. $20 = 8 + 3(12 + 4x)$
6. $-2(w - 7) + 10w = 34$

7. $9y - 4(y + 5) = 40$
8. $10 - 3(m - 2) = 8$
9. $16d - (4 - 5d) = -67$

10. $7(6x - 1) + x = 36$
11. $11 - 2(8 + 3p) = 7^2$
12. $\frac{1}{4}(5b + 11) = 19$

13. $\frac{2}{7}(4m - 18) = 12$
14. $75 = 3(-10t - 3) + 6t$
15. $-\frac{5}{6}(9 + 2x) = 40$

16. Write an equation and solve for $x$ if the area of this rectangle is 133 square units.

17. The Big Screamer Coaster carries 92 people altogether. Some of its cars carry 4 passengers, and the rest carry 6 passengers. There are three less 6-passenger cars than 4-passenger cars. How many 4-passenger cars are there?
What Do You Call Someone Who Can’t Turn Pancakes?

Cross out the letter pair next to each correct solution. For each letter pair you DON’T cross out, write the upper case letter in the box containing the lower case letter.

1. \(9y + 4 = 2y + 25\)
2. \(5n - 2 = n + 18\)
3. \(11 + 8q = 3q - 19\)
4. \(-3 - 10x = 25 + 4x\)
5. \(15a = 6a - 90\)
6. \(24 - 5d = d\)
7. Xavier is thinking of a number. Nine more than four times the number is the same as fifteen less than twice the number. What is Xavier’s number?

8. \(2 + 11b = 8b + 15\)
9. \(7m + 32 = 12 - m\)
10. \(16 - 5y = 1 - 4y\)
11. \(2x - 8x + 1 = 9 - 10x\)
12. \(-3t - 8 + 7t = 34 + 9t - 2\)
13. \(2a + 3a + 4a = 5a - 18\)
14. Yvonne is thinking of a number. Fifty, decreased by three times the number, is the same as seven times the number, increased by 80. What is Yvonne’s number?

15. \(5(x + 4) = 7x - 26\)
16. \(20 - 9w = 4(15 - w)\)
17. \(2(11 + 3n) = 12n\)
18. \(10 - 4(p + 7) = 2(1 - p)\)
19. \(11x = 8x - 3(5 - 2x)\)
20. \(9 - 6(4u - 1) = u + 15\)
21. Zabato is thinking of a number. Three times the sum of the number and ten is the same as eight times the number. What is Zabato’s number?

Equations and Problems:
Solving Equations With the Variable on Both Sides

3.15
Why Do Cowboys Have So Much Trouble With Math?

Solve each equation or problem and find your solution in the answer column. Write the letter of the answer in each box that contains the exercise number. If the answer has a ◯, shade in the box instead of writing a letter in it.

1. \(8x + 15 = 3x - 20\)
2. \(9n - 2 = 7n + 50\)
3. \(18 - 5y = y + 4\)
4. \(-7a - 10 = 20 - 3a\)
5. \(11d = 81 - 16d\)
6. \(-22 - x = 5 + 6x + 9\)
7. \(10b - 25 - 3b = 4b - 1\)
8. \(33 + 15w = 3w - w + 4w\)

9. The Sun Spa charges annual dues of $125 plus $10 per hour to use the facilities. The Moon Spa charges annual dues of $230 plus $7 per hour to use the facilities. For what number of hours would the two spas charge the same total amount?

10. \(9(m - 2) = m + 40\)
11. \(3(2p + 7) = 15(p - 4)\)
12. \(5x + 2(11 - 4x) = 82 + x\)
13. \(16 - 5(3t - 4) = 8(-2t + 11)\)
14. \(7(7c + 1) - 4c = 13(3c - 2)\)
15. \(12(5 + 2y) = 4y - (6 - 9y)\)
16. \(3q - 16q = 7 + 2(-8q - 3)\)
17. \(14 - 3(5t - 12) = 1 - (20t + 1)\)
18. Simon says: “Five times my age 4 years ago is the same as 3 times my age in 2 years.” How old is Simon now?
Why Didn't the Astronauts Land on the Moon?

Solve each problem, then cross out the letter next to the correct answer. When you're finished, the answer to the title question will remain.

1. Solve. \(4(x - 9) = 7x + 4\)

2. The square and the triangle have equal perimeters.
   A. Find the value of \(x\).
   B. Find the perimeter.

3. Omega just got her pilot's license and wants to rent a plane. The Platinum Plane Company charges $180 plus $92 per hour to rent a plane. The Plastic Plane Company charges $250 plus $78 per hour.
   A. For what number of hours would the companies charge the same amount?
   B. What would the charge be for that number of hours?

4. The launch site for Trigon Balloon Co. is 250 ft above sea level. A hot-air balloon is launched from the site and begins to rise at a rate of 110 ft/min. At the same time, another balloon 2200 ft above sea level begins to descend at a rate of 150 ft/min.
   A. How long will it be until the balloons are at the same elevation?
   B. What will their elevation be then?

5. The temperature in Coldspot is \(-7^\circ\)F and increasing \(2.5^\circ\) per hour. The temperature in Frostberg is \(19^\circ\)F and decreasing \(4^\circ\) per hour.
   A. How long will it be until the temperatures are the same?
   B. What will the temperature be then?

6. Trendy T-Shirts has decided to manufacture a new design. It will cost $400 plus $3 per shirt to produce them, and Trendy plans to spend $5000 on advertising. The shirts will sell for $12 each.
   A. How many shirts must be sold to break even (total cost equals income from sales)?
   B. What is Trendy's income (or total cost) for that many shirts?

7. Romeo and Juliet first saw each other when they were 270 feet apart. Romeo began running toward Juliet at a rate of 16 ft/s. At the same moment, Juliet began running toward Romeo at a rate of 14 ft/s.
   A. How many seconds after they started running will they meet?
   B. How far will Romeo have run then?

Equations and Problems:
Solving Problems Using Equations With the Variable on Both Sides

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Cow Conundrums

1. How Did Farmer John Find His Missing Cow?

\[ \begin{array}{cccccccccccc}
-6 & 12 \frac{1}{2} & \frac{7}{12} & 11 & -10 & 4 \frac{2}{3} & -4 \frac{1}{2} & 11 & 16 \frac{1}{3} & -10 & 9.2 & \frac{1}{5} & 16 \frac{1}{3} & -9 \frac{1}{3} & -30
\end{array} \]

2. How Did the Cow Get Over the Block of Hay?

\[ \begin{array}{cccccccccccc}
54 & -6 & 12 \frac{1}{2} & -2 \frac{1}{3} & 4 & -12 & 7.4 & -14 & 12 \frac{1}{2} & \frac{5}{1} & 14 & 23 \frac{23}{24} & 4 \frac{2}{3} & 5 & 12 \frac{1}{2}
\end{array} \]

Solve each equation and find your solution in the code. Each time the solution appears, write the letter of the exercise above it.

-5 + n + 16 = -3 \quad 4x - x = 7^2 \quad 11 + \frac{a}{6} = 20

A. 4 = 18 - 3w \quad N. \frac{2}{5}b + 1 = -11 \quad E. -9 + 2(x + 6) = 28

U. 7y - 4(3y - 5) = 80 \quad C. 10k + 3 = 6k - 15 \quad B. -\frac{5}{8} + m = \frac{1}{3}

W. 7 = -\frac{3}{4}x \quad J. 50 = -2 + 13q \quad H. 5 - \frac{9}{2}d = 32

L. \frac{7a + 1}{2} = 18 \quad R. 4(2y + 9) = 3y - 14 \quad M. 2.5n - (-8.2) = 26.7

D. -\frac{2}{3}(5p - 16) = 10 \quad T. 11 - 2(3m - 10) = 5(4 - m)
What Did the Boy Bunny Ask the Girl Bunny?

For each exercise, plot the three given points, then draw a line through them. The line, if extended, would cross a letter outside the grid. Write this letter in each box containing the exercise number.

1. (3, 4) (-1, -4) (1, 0)
2. (-5, 3) (-3, 0) (1, -6)
3. (-5, -2) (5, 6) (0, 2)
4. (-2, 1) (4, -5) (-5, 4)
5. (0, -3) (4, -1) (-2, -4)
6. (3, 1) (0, 0) (-6, -2)
7. (-7, 4) (-1, -1) (5, -6)
8. (8, -4) (4, 1) (0, 6)
9. (7, 0) (1, -4) (-5, -8)
10. (-6, 7) (0, 4) (6, 1)
11. (3, 8) (3, -3) (3, 0)
12. (-3, -5) (-8, -5) (5, -5)

Introduction to Graphs and Functions:
Plotting Points in the Coordinate Plane
Why Did the Skeleton Visit a Butcher Shop?

Choose the best graph for the situation. Write the letter of your choice in each box with the exercise number.

Suppose you are riding a bike.
Let \( x = \text{time} \); \( y = \text{distance traveled} \).

Which graph shows:
1. Speeding up (acceleration)?
2. Slowing down (deceleration)?
3. Constant speed?

Suppose you are walking to school.
Let \( x = \text{time} \); \( y = \text{distance traveled} \).

Which graph shows:
4. Speeding up, then slowing down?
5. Speeding up, then constant speed?
6. Constant speed, then slowing down?

Suppose you are running home.
Let \( x = \text{time} \); \( y = \text{distance from home} \).

Which graph shows:
7. Constant speed?
8. Speeding up as you get closer?
9. Slowing down as you get closer?

Suppose you are writing a story on a computer.
Let \( x = \text{time} \); \( y = \text{number of characters typed} \).

Which graph shows:
10. Constant speed, then stop, then a faster constant speed?
11. Constant speed, then stop, then a slower constant speed?

---

The Hurdles Race

This sketch graph shows what happened when three athletes, Flash, Krash, and Dash, competed in a 100-meter hurdles race.

a. How do you know that all three athletes were accelerating at the beginning of the race?
b. Which athlete slowed down near the end of the race? How do you know?
c. Which athlete maintained a constant speed during the last half of the race? How do you know?
d. Why might part of the graph for Krash be horizontal?
e. Who won the race? *Just for Fun: Try calling the race.*

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Introduction to Graphs and Functions:
Modeling Situations With Graphs
Adapted from *The Language of Functions and Graphs*,

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6.2
What Kind of Monkey Can Fly?

Sketch two graphs for the situation using the two dependent variables given. Match each graph to one of the answer choices. Write the letter of your choice in each box containing the exercise number.

1. Let \( y \) = Erica’s distance from home
2. Let \( y \) = Erica’s speed

As our subway train leaves Station A, it accelerates to top speed, then maintains this speed until it begins to slow down and finally stops at Station B.

3. Let \( y \) = distance from Station A
4. Let \( y \) = speed of the train

A backpacker hikes toward a campsite at a steady rate until he stops for awhile to rest. Then he continues at the original rate until he stops at the campsite.

5. Let \( y \) = distance from the campsite
6. Let \( y \) = speed of the backpacker

Our roller coaster goes slower and slower as it rolls up a hill. Then it goes faster and faster as we roll down the other side.

7. Let \( y \) = distance traveled
8. Let \( y \) = speed of the coaster

CHALLENGE: Sketch a graph for each situation.

1 Tonka walked to school at a steady rate, then realized he was late and ran the rest of the way at top speed.
2 Kia jumped off a high cliff, fell freely for awhile, then opened her parachute and floated to the ground.
3 Spike hit the ball deep into right field, then ran around the bases as fast as he could to score a home run.
What Makes a Laundry Detergent Good?

Sketch a graph for the situation using the variables given. Match your graph to one of the answer choices. Write the letter of your choice in each box containing the exercise number.

1. Roy rode his bike up a hill at a slow but steady speed, then went faster and faster as he rode down the other side.
   - Let $x = \text{time}$; $y = \text{distance traveled}$

2. Same situation as #1 above.
   - Let $x = \text{time}$; $y = \text{speed}$

3. Klash loaded 50-pound boxes on an elevator, then rode up with them.
   - Let $x = \text{number of boxes}$; $y = \text{total weight in the elevator}$

4. Ms. Snuggle filled a pot with water, then put the pot on a hot burner.
   - Let $x = \text{time}$; $y = \text{temperature of water}$

5. Mark's hair grows at a steady rate, so he gets a haircut once a month.
   - Let $x = \text{time}$; $y = \text{length of Mark's hair}$

6. Maria ran a few laps around the track, then walked a lap to cool down.
   - Let $x = \text{time}$; $y = \text{Maria's heart rate}$

7. Kortex threw a rock as far as he could from the top of a cliff.
   - Let $x = \text{time}$; $y = \text{height of rock}$

8. Kortex dropped a rock from the top of a cliff.
   - Let $x = \text{time}$; $y = \text{height of rock}$

---

CHALLENGE: Sketch a graph for each situation.

**Situation #1**

Water is flowing into a swimming pool at a constant rate. A cross section of the pool is shown. Sketch a graph to show how the depth of water in the pool varies with time.

**Situation #2**

An ant is crawling around on your kitchen counter. The path of the ant is shown. Sketch a graph to show how the distance of the ant from Point A varies with time.

---

Introduction to Graphs and Functions:
Modeling Situations With Graphs

6.4
What Did Farmer John Show His Chicken When She Wouldn’t Lay Any Eggs?

Determine whether each relation is a function. Indicate whether it “is a function” or is “not a function” by circling the appropriate letter in the chart. The answer to the title question is found by reading the circled letters in the top row, then the circled letters in the bottom row.

1. \[ \{(-1, 8), (0, 15), (1, -4), (2, 0)\} \]
2. \[ \{(-2, 7), (6, 2), (-2, -3), (0, 9)\} \]
3. \[ \{(-5, 2), (5, 2), (0, -3), (3, -8), (-7, 4), (-1, -1)\} \]
4. \[ \{(-7, 2), (4, -6), (2, -2), (-3, 9), (0, -11), (4, 0)\} \]

5. 
\[
\begin{array}{c|c}
-6 & 4 \\
-4 & 0 \\
-2 & -5 \\
0 & -5 \\
2 & 0 \\
4 & 4 \\
\end{array}
\]

6. 
\[
\begin{array}{c|c}
8 & 7 \\
-3 & 16 \\
-9 & 0 \\
15 & 33 \\
-1 & 1 \\
-9 & -6 \\
\end{array}
\]

7. 
\[
\begin{array}{c|c}
5 & 18 \\
-2 & -2 \\
0 & 12 \\
12 & 0 \\
-40 & 17 \\
-5 & 18 \\
\end{array}
\]

8. 
\[
\begin{array}{c|c}
-1 & 75 \\
0 & 80 \\
1 & 85 \\
0 & 90 \\
-1 & 95 \\
\end{array}
\]

9. 

10. 

11. 

12. 

13. 

14. 

IS A FUNCTION > ARGEOLOFDEEGOGG

NOT A FUNCTION > INSTATMEPOLALLE

Introduction to Graphs and Functions:
Determining Whether a Relation Is a Function

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6.5
**Why Did the Greenhouse Call a Doctor?**

Answer each question, then find your answer and cross out the letters above it. When you finish, write the remaining letters in the spaces at the bottom of the page.

In Exercises 1-3, find the domain and range of the relation.

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   domain: ___________________  range: ______________

3. 
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<td>12</td>
</tr>
</tbody>
</table>

   domain: ___________________  range: ______________

In Exercises 4-7, find the indicated values for the function.

4. \( f(x) = 4x - 7 \)
   a. \( f(3) \)  
   b. \( f(-5) \)

5. \( f(x) = -3x + 10 \)
   a. \( f(4) \)  
   b. \( f(-9) \)

6. \( g(x) = x^2 + 5x - 1 \)
   a. \( g(6) \)  
   b. \( g(-4) \)

7. \( h(x) = -2x^2 - 3x + 8 \)
   a. \( h(5) \)  
   b. \( h(0) \)

In Exercises 8-13, find the range of the function for the given domain.

8. \( f(x) = 2x + 7 \)  \{5, 18, -5\}

9. \( g(x) = 9 - 4x \)  \{-2, 10, -1\}

10. \( F(x) = 3x^2 - 1 \)  \{2, 4, -3\}

11. \( h(x) = x^2 + 8x - 3 \)  \{1, 5, -2\}

12. \( f(t) = \frac{t^2 + 2t}{t - 5} \)  \{4, 7, -2\}

13. \( G(n) = -n^2 + 3n + 2 \)  \{5, -3, 0\}

---

Introduction to Graphs and Functions:
Domain and Range

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6.6
How Does a Backward Poet Write?

For each situation, complete the table and graph. For table cells with letters, write the letter in the corresponding box at right.

**Situation #1. Arranging Tables.**

A square table has one seat on each side. Square tables are pushed together to make banquet tables. Draw banquet table #4 in the pattern above. Then complete the table and graph to show how the number of seats varies with the number of tables that are pushed together.

Let \( n = \) Number of tables

\( S = \) Number of seats

**Equation:**

\[ S = \]

**Situation #2. Building Bridges.**

These bridges are constructed using rods to make equilateral triangles. The length of a bridge is the number of rods used to construct the bottom span. Draw bridge #4 in the pattern above. Then complete the table and graph to show how the number of rods used varies with the length of the bridge.

Let \( n = \) Length of bridge

\( R = \) Number of rods

**Equation:**

\[ R = \]
What Does It Take to Win a Tug of War?
Find the rate of change represented by each line (some answers are rounded). Cross out the letters above each correct answer. Write the remaining letters in the spaces at the bottom of the page.

rate of change: _____
rate of change: _____
flow rate (A): _____
flow rate (B): _____
butter: _____
cream cheese: _____
plant A: _____
plant B: _____
12" candle: _____
8" candle: _____
rate for talk time over 400 min: _____
rate for printer A: _____
rate for printer B: _____
rate for first 4 h: _____
rate for next 8 h: _____

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<td>4°F/h</td>
<td>$0.33/poster</td>
<td>20 gal/min</td>
<td>$0.45/min</td>
<td>0.5 in./wk</td>
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<td>0.8 in./wk</td>
<td>2.5°F/h</td>
<td>35 mi/h</td>
<td>$0.35/min</td>
<td>-50 mi/h</td>
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<td>KS</td>
<td>E</td>
</tr>
<tr>
<td>-1.5 in./h</td>
<td>$0.50/poster</td>
<td>50 cal/oz</td>
<td>15 gal/min</td>
<td>1 in./wk</td>
<td>-1.33 in./h</td>
<td>$0.40/poster</td>
<td>13.3 gal/min</td>
</tr>
</tbody>
</table>

Linear Equations and Their Graphs
Rate of Change

7.2
What Do You Call a Scary Dog That Knows What's Happening?

For each situation, complete the table, then draw two graphs and write two equations. For table cells with letters, write the letter in the corresponding box at right.

Sales Job. Prime Products will pay you a weekly salary of $100 plus 10% of sales. Digit Displays will pay you a weekly salary of $300 plus 5% of sales. Show how your total weekly earnings at each store is a function of your sales.

<table>
<thead>
<tr>
<th>Sales ($/wk)</th>
<th>Earnings ($/wk)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prime</td>
</tr>
<tr>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>5000</td>
<td></td>
</tr>
<tr>
<td>6000</td>
<td></td>
</tr>
</tbody>
</table>

Equations:

Burning Gas. A Turbo averages 10 miles per gallon, and the gas tank holds 30 gallons. A Tork averages 25 miles per gallon, and its gas tank holds 16 gallons. If both cars start with full tanks, show how the amount of gas left in the tank is a function of the number of miles driven.

<table>
<thead>
<tr>
<th>Miles Driven</th>
<th>Gas Left (gal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>30 16</td>
</tr>
<tr>
<td>50</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td></td>
</tr>
<tr>
<td>350</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td></td>
</tr>
</tbody>
</table>

Equations:

Crawlin' Critters. An oak tree is 30 ft from an elm tree. A snail started crawling from the oak to the elm at a rate of 4 ft/h. A turtle started crawling from the elm to the oak at a rate of 5 ft/h. Show how the distance of each animal from the oak tree is a function of time since they started crawling.

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Distance (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Snail Turtle</td>
</tr>
<tr>
<td>0</td>
<td>0 30</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Equations:

Linear Equations and Their Graphs:
Equations, Tables, and Graphs for Linear Relationships
What Does a Boy Who Likes To Play With Switches Do?

Fill in each blank with one of the choices to the right. The letter to the left of each blank goes in the box containing the number of the answer.

The Coordinate Plane

1. The ______ plane has two number lines that intersect at a point called the _______. The horizontal number line is called the _______. The vertical number line is called the _______. The two axes divide the coordinate plane into four parts called _______. The location of a point in the coordinate plane is given using an _______ of numbers. The first number is the _______. The second number is the _______. Label the origin, axes, and quadrants in the figure at the top of the answer column.

Equations in Two Variables

For an equation with two variables, x and y, a pair of values (x,y) that make the equation true is called a _______ of the equation. Each solution is an _______. The value of x is written _______; the value of y is written _______. Each solution can be represented as a _______ in the coordinate plane. The set of all points representing solutions is called the _______ of the equation. An equation in two variables has an _______ number of solutions, so there is an infinite number of _______ in the graph.

Linear Equations

If the graph of an equation in two variables is a straight line, the equation is a _______ equation. Every solution can be represented by a _______ on the line, and every point on the line represents a _______ of the equation. For example, the equation y = 2x + 5 is a linear equation because its graph is a _______. One solution of this equation is _______. 2x + 3y = 90 is a linear equation because its _______ is a line. In a linear equation, the highest power of either variable is the _______ power.
How Does the Average Man Feel Today?

Complete the table of solutions for each equation. Graph the solutions and draw a line through them. If extended, the line will cross a letter. Write this letter in each box containing the exercise number.

<table>
<thead>
<tr>
<th>y = 3x - 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>-2</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>y = -2x + 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>-1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>y = -x - 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>-1</td>
</tr>
<tr>
<td>-6</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>y = \frac{1}{2}x + 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>-6</td>
</tr>
<tr>
<td>-2</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>y = 7 - 2x</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>-1</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>y = -\frac{2}{3}x + 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>-3</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x + y = 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>-2</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x + 2y = 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>-2</td>
</tr>
<tr>
<td>-6</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>
Why Did the Rug Roll Up Around His Girl Friend?

Write the x- and y-intercepts of the graph of the equation. Then use them to draw the graph. If extended, the graph will cross a letter. Write this letter in the box containing the exercise number.

1. \( x + y = 4 \)
2. \( -x + y = 4 \)
3. \( 2x + 5y = 10 \)
4. \( -2x - 5y = 10 \)
5. \( 3x + 4y = 12 \)
6. \( -3x + 4y = 12 \)
7. \( 4x + 3y = -12 \)
8. \( -4x + 3y = -12 \)
9. \( 2x + y = 5 \)
10. \( 3x - 2y = 9 \)
11. \( x + 4y = -6 \)
12. \( -5x + 8y = 20 \)
13. \( 5x - 3y - 15 = 0 \)
14. \( x + 2y + 3 = 0 \)
15. \( -3x + 5y - 15 = 0 \)
16. \( y = 6 - 6x \)

Linear Equations and Their Graphs:
Using Intercepts to Graph a Linear Equation

PUNCHLINE • Algebra • Book A
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Cumulative Test

34. What number is 45% of 245?
   F 5.4          H 110.25
   G 18.37        J 200

35. What is 8 increased by 60%?
   A 4.8          C 14
   B 12.8         D 64.8

36. Name the figure.
   F pentagon
   G octagon
   H hexagon
   J heptagon

37. Which of the following pairs of ratios forms a proportion?
   A \( \frac{3}{8} \) and \( \frac{6}{16} \)
   B \( \frac{4}{9} \) and \( \frac{5}{10} \)
   C \( \frac{1}{2} \) and \( \frac{2}{3} \)
   D \( \frac{11}{20} \) and \( \frac{1}{2} \)

38. Classify \( -\sqrt{25} \) as rational, irrational, or not real. If rational or irrational, give the approximate equivalent value.
   F rational; \( -5 \)
   G irrational; \( 5 \)
   H irrational; \( 5 \)
   J not real

39. Choose which scale keeps the size of the actual object.
   A 12 in.:6 ft
   B 1 cm:1 m
   C 1 m:100 mm
   D 36 in.:1 yd

40. Express 2.25 as a fraction.
   F \( \frac{22}{5} \)
   G \( \frac{11}{25} \)
   H \( \frac{9}{4} \)
   J \( \frac{21}{5} \)

41. Find \( -\sqrt{21} \) to the nearest tenth.
   A 2.1          C 10.5
   B \( -\sqrt{21} \)
   D \( -\sqrt{21} \)

42. Solve \( 3(3n) = -9 \).
   F \( n = 1 \)
   G \( n = -1 \)
   H \( n = 9 \)
   J \( n = -9 \)

43. A book costs \$25.75. Sales tax is 6%. What is the total cost?
   A \$25.81
   B \$26.35
   C \$27.04
   D \$27.30

44. Determine which of the following is a solution to \( y = 2x - 3 \).
   F \((-1, -1)\)
   G \((1, -1)\)
   H \((2, 3)\)
   J \((1, 2)\)

45. Find \((-2)^{-2}\).
   A 8
   B \(-\frac{1}{4}\)
   C 4
   D \(\frac{1}{4}\)

46. When dilating a triangle, to enlarge the triangle you must use a scale factor that is:
   F \( > 1 \)
   G \( < 1 \)
   H \( = 1 \)
   J \( = 0 \)
25. Identify a pair of congruent angles.

A \( \angle AOD \) and \( \angle BOC \)
B \( \angle AOD \) and \( \angle AOB \)
C \( \angle BOC \) and \( \angle COD \)
D \( \angle AOB \) and \( \angle BOC \)

26. Simplify \( \frac{d^3}{d^5} \).

F \( \frac{d^2}{d^5} \)
G \( \frac{1}{d^5} \)
J \( \frac{d^3}{d^5} \)

27. What are the coordinates of point \( B \) on the graph?

A (5, -8)
B (5, 8)
C (-8, 5)
D (8, 5)

28. Simplify \( 1\frac{2}{3} - \frac{11}{18} \).

F \( \frac{19}{18} \)
H \( \frac{10}{21} \)
G \( \frac{3}{7} \)
J \( \frac{14}{21} \)

29. Triangle \( ABC \equiv \) triangle \( DEF \). Find \( z \).

A 2
B 8
C 3
D 5

30. The graph represents which inequality?

F \( x \geq -5 \)
H \( x < 5 \)
G \( x > -5 \)
J \( x < -5 \)

31. Simplify \( 2\frac{5}{6} + \frac{1}{3} \).

A \( 3\frac{7}{12} \)
B \( 3\frac{1}{6} \)
C \( 3\frac{1}{3} \)
D \( 2\frac{1}{3} \)

32. In \( \triangle ABC \), \( \angle A \) and \( \angle B \) have the same measure. \( m\angle C \) is \( 92^\circ \). Find \( m\angle A \).

F \( 44^\circ \)
G \( 88^\circ \)
H \( 46^\circ \)
J \( 134^\circ \)

33. What is the term for part of a line that starts at one point and extends infinitely in one direction?

A point
B ray
C line
D line segment
15. Find the unknown number in the proportion: \( \frac{5}{f} = \frac{20}{8} \).
   A) \( f = 0.08 \)  B) \( f = 2 \)  C) \( f = 20 \)  D) \( f = 12.5 \)

16. Which ordered pair is a solution to 
   \( y = 3x - 5 \)?
   F) (1, 2)  G) (2, 1)  H) (3, 1)  J) (4, 3)

17. Convert 24 pints to cups.
   A) 6 c  B) 48 c  C) 3 c  D) 12 c

18. Express \( 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 \) using exponents.
   F) \( 4^6 \)  G) \( 6^4 \)  H) 24  J) \( 4^5 \)

19. Find \( (-2)^{-4} \).
   A) 16  B) \( -\frac{1}{16} \)  C) -16  D) \( \frac{1}{16} \)

20. The population of a small country is 5,740,000. Express this number using scientific notation.
   F) \( 5.74 \times 10^8 \)  G) \( 5.74 \times 10^5 \)  H) \( 5.74 \times 10^4 \)  J) \( 57.4 \times 10^4 \)

21. Choose the graph that most likely represents the distance a child travels while riding her bike at a steady speed.
   \[ \text{Distance (ft/min)} \]
   \[ \text{Time (min)} \]
   A  B  C  D

22. In the figure, which angle is a complement to \( \angle EBF \)?
   F) \( \angle DBE \)  G) \( \angle EBA \)  H) \( \angle CBF \)  J) \( \angle ABD \)

23. Find the unknown length in the pair of similar triangles.
   \[ \text{5} \]
   \[ \text{3} \]
   \[ \text{6} \]
   \[ \text{4} \]
   \[ \text{8} \]
   A) 11  B) 5  C) 15  D) 10

24. Which number is equivalent to 35%?
   F) 0.07  G) \( \frac{1}{4} \)  H) \( \frac{7}{20} \)  J) 3.5
1. Evaluate $6xy + 3$ for $x = -5$ and $y = 3$.
   A $-90$  
   B $24$  
   C $87$  
   D $-87$

2. Solve $m + 5 = 11$.
   F $m = 16$  
   G $m = -16$  
   H $m = 6$  
   J $m = -6$

3. The scale on a map is 1 in.:2.5 mi. What is the length of 42 miles on the map?
   A $105$ in.  
   B $16.8$ in.  
   C $44.5$ in.  
   D $19.3$ in.

4. Solve $8(s - 3) = 24$.
   F $s = 6$  
   G $s = 0$  
   H $s = 3$  
   J $s = -3$

5. Solve $(-16) - (-7)$.
   A $-23$  
   B $-11$  
   C $-9$  
   D $11$

6. Which algebraic expression means “73 minus a number”?
   F $n - 73$  
   G $-n + 73$  
   H $-73 - n$  
   J $73 - n$

7. Which pair of numbers does $\frac{5}{8}$ come between?
   A $\frac{1}{4}$ and $\frac{1}{2}$  
   B $\frac{4}{5}$ and $1$  
   C $\frac{7}{10}$ and $\frac{8}{9}$  
   D $\frac{4}{7}$ and $\frac{2}{3}$

   F $18.985$  
   G $19.985$  
   H $25.816$  
   J $32.785$

9. Which ordered pair lies on the line that represents the equation $y = x - 5$?
   A $(2, -3)$  
   B $(-2, 3)$  
   C $(10, 15)$  
   D $(0, 5)$

10. Which set of ordered pairs represents a function?
    F $(2, 5), (1, 6), (0, 5), (1, 10)$  
    G $(0, 0), (1, 1), (2, 0), (3, 3)$  
    H $(2, 1), (3, 1), (5, 1), (5, 4)$  
    J $(5, 4), (4, 5), (1, 2), (1, 4)$

11. Find $\sqrt{43}$ and round your answer to the nearest hundredth.
    A $43.0$  
    B $6.5$  
    C $6.56$  
    D $6.55$

12. What is the missing number in the sequence $1, 14, __, 40, 53, ...$?
    F $24$  
    G $27$  
    H $28$  
    J $35$

13. Solve $7.8 = n + 6.6$.
    A $n = 14.4$  
    B $n = 11.8$  
    C $n = 1.2$  
    D $n = -1.2$

14. Jen's pay for a week was $82.20. If she worked 12 hr, what was her rate of pay?
    F $6.85 per hr$  
    G $6.73 per hr$  
    H $6.98 per hr$  
    J $7.29 per hr$
41. Which side lengths do NOT form a right triangle?
   A 9 m, 12 m, 15 m
   B 7 m, 24 m, 25 m
   C 6 m, 8 m, 10 m
   D 10 m, 12 m, 16 m

42. Solve \( k + 1.5 = 27 \).
   F \( k = 12 \)  
   G \( k = 24.5 \)  
   H \( k = 25.5 \)  
   J \( k = 28.5 \)

43. What equation could be written for this table?

<table>
<thead>
<tr>
<th>( x )</th>
<th>10</th>
<th>9</th>
<th>6</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>-1</td>
</tr>
</tbody>
</table>

   A \( x - y = 6 \)  
   B \( y = 3x \)  
   C \( x + y = 14 \)  
   D \( y = 0x \)

44. What is the missing term in the sequence 41, 19, -3, \( \_
\), -47, ...?
   F -81  
   G -36  
   H -25  
   J 16
28. Express 2.125 as a fraction.
   - F \( \frac{21}{8} \)
   - H \( \frac{2}{5} \)
   - G \( 21\frac{1}{4} \)
   - J \( \frac{2}{3} \)

29. Solve \( 0.667a + 5 = 1.667a \).
   - A \( a = 1.667 \)
   - B \( a = -5 \)
   - C \( a = 5 \)
   - D \( a = 10 \)

30. Solve \(-7 < \frac{b}{3}\).
   - F \( b < -21 \)
   - G \( b > -21 \)
   - H \( b < 21 \)
   - J \( b > 21 \)

31. Determine which ordered pair is a solution of the equation \( y + 3x = 15 \).
   - A \( (5, 0) \)
   - B \( (6, 3) \)
   - C \( (5, 1) \)
   - D \( (-6, 3) \)

32. On the graph, Point C represents which ordered pair?

33. Simplify \(-4 + (-12)\).
   - A \(-8\)
   - B \(-16\)
   - C \(16\)
   - D \(8\)

34. Simplify \(-1 + 9(5 - 3m)\).
   - F \(44 + 27m\)
   - G \(45 - 27m\)
   - H \(44 - 3m\)
   - J \(44 - 27m\)

35. Simplify \((2 - 6)^{-3}\).
   - A \(\frac{1}{64}\)
   - B \(64\)
   - C \(-\frac{1}{64}\)
   - D \(128\)

36. Evaluate \(p - 10\) for \(p = 15\).
   - F \(-5\)
   - G \(5\)
   - H \(15\)
   - J \(25\)

37. Find the sum of \(\frac{3}{5} + \frac{5}{8}\).
   - A \(\frac{15}{40}\)
   - B \(\frac{49}{80}\)
   - C \(\frac{8}{13}\)
   - D \(1\frac{9}{40}\)

38. Solve \(10 = 10 - 2m\).
   - F \(-2\)
   - G \(0\)
   - H \(10\)
   - J \(20\)

39. Which equation is NOT a function?
   - A \(y = 4\)
   - B \(-y = x\)
   - C \(y = 1 - x\)
   - D \(x = 3\)

40. Simplify \((x^3)(x^6)\).
   - F \(x^9\)
   - G \(x^6\)
   - H \(x^9\)
   - J \(x^{16}\)
16. The area of the top of a square table is 240 in\(^2\). What are the dimensions of the top? Round your answer to the nearest hundredth.
   F 12 inches × 20 inches
   G 15.49 inches × 15.49 inches
   H 24 inches × 10 inches
   J 61.97 inches × 4 inches

17. Jacob drove 450 miles at an average rate of 65 miles per hour. Rounded to the nearest tenth of an hour, how long did the trip take?
   A \(6\frac{9}{10}\) hr
   C \(6\frac{93}{100}\) hr
   B \(1\frac{1}{10}\) hr
   D \(1\frac{14}{100}\) hr

18. Convert the following to an algebraic expression: "Leana earned $25 a day at her job. If she works five days a week, how much did she earn in \(n\) weeks?"
   F \(25 + n\)
   H \(25n\)
   G \(125n\)
   J \(25 + 5n\)

19. Simplify \(\frac{10}{5}\).
   A 5
   C \(-5\)
   B 2
   D \(-2\)

20. To obtain a party mix, Marla mixed \(2\frac{1}{4}\) pounds of peanuts, \(5\frac{1}{3}\) pounds of chocolate candies, and 5 pounds of raisins. What was the total weight?
   F \(\frac{5}{18}\) lb
   H \(12\frac{7}{12}\) lb
   G \(3\frac{3}{5}\) lb
   J \(\frac{12}{151}\) lb

21. Simplify \(-\frac{2}{7} - (-\frac{4}{7})\).
   A \(-\frac{6}{7}\)
   C \(\frac{2}{7}\)
   B \(-\frac{2}{7}\)
   D \(\frac{6}{7}\)

22. Solve \(4b \leq -\frac{2}{3}\).
   F \(b \leq -\frac{1}{6}\)
   H \(b \geq -\frac{8}{3}\)
   G \(b \leq -\frac{8}{3}\)
   J \(b \geq -\frac{1}{6}\)

23. Divide \(\frac{7}{8} \div \frac{5}{6}\).
   A \(\frac{35}{42}\)
   C \(\frac{20}{21}\)
   B \(1\frac{1}{20}\)
   D \(\frac{6}{7}\)

24. Jill's last grocery bills were $65.72, $55.82, $68.70, $78.19, $64.80, and $40.66. Find the average bill and round your answer to the nearest cent.
   F $93.47
   H $62.78
   G $74.78
   J $62.32

25. Solve \(10x \geq -70\).
   A \(x > -7\)
   C \(x = -7\)
   B \(x \geq -7\)
   D \(x \leq -7\)

26. Evaluate \(\frac{7a - 5b}{6}\) when \(a = 6\) and \(b = 7\).
   F \(\frac{19}{6}\)
   H \(\frac{77}{6}\)
   G \(\frac{20}{3}\)
   J \(\frac{7}{6}\)

27. Simplify \(6v - 8 - 6v + 16\).
   A 24
   C 8
   B \(v + 24\)
   D \(12v + 8\)
1. Simplify $\sqrt{-16}$.
   A $-4$  C $4$
   B $8$  D not real

2. Which is equivalent to $12^4$?
   F $12 \cdot 12 \cdot 12 \cdot 12$
   G $12 \cdot 4$
   H $12 \cdot 12 \cdot 12 \cdot 12 \cdot 12$
   J $12 \div 4$

3. Describe and give the value of $-\sqrt{100}$.
   A Irrational, $-50$
   B Not a real number
   C Irrational, $-10$
   D Rational, $-10$

4. Express 1,900,000 in scientific notation.
   F $1.9 \times 10^5$
   H $1.9 \times 10^6$
   G $10 \times 1.9^5$
   J $10 \times 1.9^6$

5. Express $7.3 \times 10^5$ in standard notation.
   A $73$
   C $73,000$
   B $7,300,000$
   D $730,000$

6. Find the two square roots of $\frac{81}{25}$.
   F $\frac{9}{5}, -\frac{9}{5}$
   H $\sqrt{\frac{9}{5}}, \sqrt{-\frac{9}{5}}$
   G $9, -9$
   J $9, 5$

7. Which of the following is the same as the phrase, "The product of twice a number and 3 is 84"?
   A $6a = 84a$
   C $2a + 3 = 84$
   B $6a = 84$
   D $2a = 3(84)$

8. Solve $10x - 4 = 36$.
   F $x = -4$
   H $x = 4$
   G $x = 6$
   J $x = 32$

   A $6^{21}$
   C $6^4$
   B $6^{10}$
   D $36^{21}$

10. Which expression is equal to $(-3n)(-3n)(-3n)(-3n)$?
    F $-12n$
    H $-3n^4$
    G $-(3n)^4$
    J $(-3n)^4$

    A $b = 6$
    C $b < -6$
    B $b = -6$
    D $b \leq -6$

12. Evaluate $4^{-3}$.
    F $-12$
    H $-8^1$
    G $\frac{1}{64}$
    J $-\frac{3}{4}$

13. Simplify $12 - (-13)$.
    A $-25$
    C $-1$
    B $1$
    D $25$

14. Find the area of a rectangle that measures $2\frac{2}{3}$ in. by $3\frac{1}{2}$ in.
    F $78\frac{1}{3}$ in$^2$
    H $97\frac{1}{3}$ in$^2$
    G $81$ in$^2$
    J $39\frac{1}{6}$ in$^2$

15. The eighth grade at Byndale Junior High School has 464 students. There are 212 more boys than girls. How many boys are there?
    A 212 boys
    C 126 boys
    B 338 boys
    D 464 boys
35. What equation could be written for this table?

<table>
<thead>
<tr>
<th>x</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>3</td>
<td>$3\frac{1}{2}$</td>
<td>4</td>
<td>$4\frac{1}{2}$</td>
</tr>
</tbody>
</table>

A. $y = x + 2\frac{1}{2}$  
B. $y = x + 3$  
C. $y = x + 2$  
D. $y = \frac{1}{2}x + 3$

36. What is the next term in this sequence?
2, 5, 8, 11, ...

F. 14  
G. 15  
H. 19  
J. 40

37. What is the rule for this sequence?
$-1, -5, -9, -13, ...$

A. multiply by $-4$  
B. add $-4$  
C. double the previous value  
D. add 6

38. What is the absolute value of $-9$?

F. 0  
G. 9  
H. 1, 3, and 8  
J. $+3$ and $-3$

39. What is the product of $-10$ and 7?

A. $-70$  
B. $-3$  
C. 17  
D. 70

40. Solve the equation $-9 = g - 2$.

F. $g = -11$  
G. $g = -7$  
H. $g = 11$  
J. $g = 18$

41. Which number is greater than $\frac{3}{4}$?

A. 0.34  
B. 0.56  
C. 0.7  
D. 0.8

42. What is the product of $\frac{1}{10}$ and 20?

F. $\frac{1}{200}$  
G. $\frac{1}{5}$  
H. 2  
J. 20

43. Solve $c + \frac{5}{8} = \frac{7}{8}$.

A. $c = \frac{1}{8}$  
B. $c = \frac{1}{4}$  
C. $c = \frac{1}{2}$  
D. $c = 2\frac{1}{8}$

44. Solve the equation $2p + 5 = 30$.

F. $p = 10$  
G. $p = 12\frac{1}{2}$  
H. $p = 17\frac{3}{5}$  
J. $p = 37$

45. Which equation is NOT a function?

A. $y - x = 6$  
B. $y = 2x^2$  
C. $x = -2$  
D. $y + x = 12$

46. What equation is shown in the graph below?

- F. $y = -0.5x$  
- H. $y = x - 2$  
- G. $y = -2x$  
- J. $y = 2 - x$
25. Which value is between −7 and 0?
   A  −9  C  −1
   B  −7  D  3

26. What is the quotient of −56 divided by −8?
   F  −9  H  6
   G  −8  J  7

27. Solve 9 = x + 4.
   A  x = 5  C  x = 15
   B  x = 13  D  x = 36

28. Solve 48 = 12v.
   F  v = 4  H  v = 36
   G  v = 12  J  v = 60

29. Which number is between 1.2 and 1.21?
   A  1.19  C  1.208
   B  1.199  D  1.22

30. What is the product of 0.25 and 1.6?
   F  0.25  H  1.85
   G  0.4  J  6.4

31. Solve 5 = \(\frac{1}{2}m + 3\).
   A  \(m = 1\frac{1}{2}\)  C  \(m = 6\)
   B  \(m = 4\)  D  \(m = 10\)

32. Solve 9 = −2x + 3.
   F  x = −6  H  x = 3
   G  x = −3  J  x = 4

33. Which graph corresponds to the temperature in an oven that is turned on to bake a loaf of bread then turned off when the bread is done?
   A
   B
   C
   D

34. Which graph is NOT a function?
   F
   G
   H
   J
15. Simplify \( \frac{17}{51} \).

A 3  
B \( \frac{1}{4} \)  
C \( \frac{1}{3} \)  
D 4

16. What is the phrase, "the difference of 8 times a number \( r \) and 12," as an algebraic expression?

F \( 12 - 8r \)  
G \( 8 - r + 12 \)  
H \( 8r - 12 \)  
J \( 12 + 8r \)

17. A rectangular scarf measures \( \frac{5}{3} \) inches by \( \frac{9}{2} \) inches. What is the distance around the scarf?

A 264 in.  
B \( 54 \frac{5}{6} \) in.  
C \( 109 \frac{2}{3} \) in.  
D 115 in.

18. Divide \( 2 + \frac{2}{15} \).

F \( \frac{4}{15} \)  
G 15  
H \( \frac{1}{15} \)  
J \( \frac{2}{15} \)

19. Martin has a 4-inch board that he wants to be \( 3 \frac{11}{16} \) inches wide. How much does he need to trim off?

A \( 7 \frac{11}{16} \) in.  
B \( \frac{5}{16} \) in.  
C \( \frac{11}{16} \) in.  
D \( 4 \frac{5}{16} \) in.

20. A rectangular garden measures \( 2 \frac{2}{3} \) feet by \( 50 \frac{1}{2} \) feet. What is the distance around the garden?

F \( 106 \frac{1}{3} \) ft  
G \( 53 \frac{1}{6} \) ft  
H \( 134 \frac{2}{3} \) ft  
J 109 ft

21. Translate \( \frac{y}{2} + 3y \) into words.

A \( y \) divided by two, plus three times \( y \)  
B half a number plus 3  
C 2 times the quotient of \( y \) and 3  
D the product of half of \( y \) and 3 times \( y \)

22. What are the coordinates of point \( C \) on the graph?

F (8, 6)  
G (-8, 6)  
H (6, -8)  
J (-6, -8)

23. Which ordered pair is a solution of \( 5x - y = 6 \)?

A (3, 9)  
B (5, 15)  
C (3, 15)  
D (45, 5)

24. Which ordered pair is a solution of \( 3y = 6x + 3 \)?

F (7, 3)  
G (-6, -3)  
H (3, 7)  
J (-7, -12)
1. Simplify $-23 + (-14)$.
   A $-9$       C $-37$
   B $37$       D $9$

2. Simplify $10 + (-7)$.
   F $17$       H $-17$
   G $3$        J $-3$

3. Simplify $\left(-\frac{4}{15}\right) \left(\frac{3}{7}\right)$.
   A $-\frac{4}{35}$
   B $\frac{2}{29}$
   C $-\frac{24}{29}$
   D $-\frac{2}{29}$

4. Simplify $\frac{42}{70}$.
   F $\frac{6}{12}$
   G $\frac{6}{7}$
   H $\frac{3}{5}$
   J $\frac{14}{15}$

5. Evaluate $5r + 9s + 6$ for $r = 0$ and $s = 8$.
   A $78$       C $83$
   B $46$       D $15$

6. Evaluate $\frac{c + 4}{9}$ for $c = 4$.
   F $\frac{22}{9}$
   G $\frac{16}{9}$
   H $\frac{9}{8}$
   J $\frac{8}{9}$

7. Divide $\frac{3}{8} \div \frac{2}{5}$.
   A $\frac{15}{16}$
   B $\frac{3}{20}$
   C $\frac{31}{40}$
   D $\frac{1}{40}$

8. Multiply $\frac{5}{8} \left(-\frac{7}{12}\right)$.
   F $-\frac{35}{96}$
   G $-\frac{60}{56}$
   H $\frac{12}{20}$
   J $\frac{2}{4}$

9. Solve $m = \frac{1}{2}m = -4$.
   A $m = -2$       C $m = 1$
   B $m = -8$       D $m = 2$

10. Solve $-b - 2 = 18$.
    F $b = 16$       H $b = -16$
    G $b = 20$       J $b = -20$

11. Solve $3.7a + 4 = 2.7a - 8$.
    A $a = -11$       C $a = -13$
    B $a = -2$       D $a = -12$

12. Which is the solution of $5x < -28 + x$?
    F $-10 \underline{-8} \underline{-6} \underline{-4} \underline{-2}$
    G $-10 \underline{-8} \underline{-6} \underline{-4} \underline{-2}$
    H $-10 \underline{-8} \underline{-6} \underline{-4} \underline{-2}$
    J $-10 \underline{-8} \underline{-6} \underline{-4} \underline{-2}$

13. Solve $-55.2 = -6.9c$.
    A $c = 8.0$       C $c = 48.3$
    B $c = 2.0$       D $c = -48.3$

14. Express $1.25$ as a fraction.
    F $\frac{5}{4}$
    G $1\frac{2}{5}$
    H $\frac{1}{4}$
    J $1\frac{3}{4}$
What is $\frac{9}{10} - \frac{3}{4}$?

F $\frac{3}{40}$  
G $\frac{3}{20}$

What integer is less than $-8$?

A $-11$  
B $-7$  

Solve the equation $k - 6 = 11$.

F $-66$  
G $-5$

39. Solve $7w = 0$.

A $w = -7$  
B $w = 0$  
C $w = 7$  
D $w = 70$

40. What number is less than $1\frac{1}{5}$?

F $1.15$  
G $1.25$  
H $1.4$  
J $11.5$
Cumulative Test

28. Select the graph that is the solution to the inequality \( x \geq 4 \).

   \[ F \][Graph A]
   \[ G \][Graph B]
   \[ H \][Graph C]
   \[ J \][Graph D]

29. Solve \(-10 + 3h = 10 - h\).
   \begin{align*}
   A & \quad h = 0 \\
   B & \quad h = 5 \\
   C & \quad h = -10 \\
   D & \quad h = 10
   \end{align*}

30. Which algebraic expression matches the word phrase, "the quotient of a number increased by one and seven"?
   \begin{align*}
   F & \quad 7(n + 1) \\
   G & \quad 7n + 7 \\
   H & \quad \frac{n + 7}{1} \\
   J & \quad \frac{n + 1}{7}
   \end{align*}

31. Solve \(|-2| + |-8|\).
   \begin{align*}
   A & \quad -10 \\
   B & \quad -6 \\
   C & \quad 6 \\
   D & \quad 10
   \end{align*}

32. Solve the equation \( r + 5 = 13 \).
   \begin{align*}
   F & \quad r = 18 \\
   G & \quad r = 8 \\
   H & \quad r = -8 \\
   J & \quad r = -18
   \end{align*}

33. Solve \( 9 = \frac{m}{3} \).
   \begin{align*}
   A & \quad m = 3 \\
   B & \quad m = 6 \\
   C & \quad m = 12 \\
   D & \quad m = 27
   \end{align*}

34. Which number is between 0.6 and 0.7?
   \begin{align*}
   F & \quad \frac{2}{5} \\
   G & \quad \frac{1}{2} \\
   H & \quad \frac{2}{3} \\
   J & \quad \frac{3}{4}
   \end{align*}

35. What is \( \frac{3}{4} \) of \( \frac{1}{8} \)?
   \begin{align*}
   A & \quad \frac{3}{32} \\
   B & \quad \frac{1}{6} \\
   C & \quad 4 \\
   D & \quad 6
   \end{align*}
**Cumulative Test**

**CHAPTER 2**

7. Simplify \( \frac{80}{104} \).
   - A \( \frac{1}{3} \)
   - B \( \frac{40}{52} \)
   - C \( \frac{10}{13} \)
   - D \( \frac{8}{10} \)

8. Simplify \( \frac{-5}{13} - \left( -\frac{9}{13} \right) \).
   - F \( \frac{-14}{13} \)
   - H \( \frac{14}{13} \)
   - G \( \frac{4}{13} \)
   - J \( -\frac{4}{13} \)

9. Express the phrase, "8 more than three times a number is less than or equal to 34," as an algebraic expression.
   - A \( 3x + 8 > 34 \)
   - B \( 3x - 8 \leq 34 \)
   - C \( 3x + 8 \leq 34 \)
   - D \( 3x + 8 < 34 \)

10. Multiply \( 7 \left( -\frac{6}{7} \right) \).
    - F \( 6 \)
    - H \( \frac{13}{7} \)
    - G \( -\frac{13}{7} \)
    - J \( -6 \)

11. Simplify \( \left( -\frac{7}{25} \right) \left( -\frac{1}{5} \right) \).
    - A \( \frac{7}{5} \)
    - B \( \frac{7}{125} \)
    - C \( \frac{7}{30} \)
    - D \( \frac{7}{20} \)

22. Solve \( \frac{1}{2} m = 5 \).
    - F \( m = 10 \)
    - G \( m = 2.5 \)
    - H \( m = 0.25 \)
    - J \( m = 1 \)

23. Express the phrase, "12 is less than twice a number \( x \)," as an algebraic expression.
    - A \( 12 < 2x \)
    - B \( 12 - 2x \)
    - C \( 2x < 12 \)
    - D \( 2x - 12 \)

24. Solve \( -0.111c + 1 = 0.889c \).
    - F \( c = 10.0 \)
    - G \( c = 0.778 \)
    - H \( c = 1 \)
    - J \( c = -0.778 \)

25. Express the phrase, "2 times the quotient of a number \( y \) and nine," as an algebraic expression.
    - A \( \frac{9}{2y} \)
    - B \( 2y - 9 \)
    - C \( 18y \)
    - D \( 2 \left( \frac{y}{9} \right) \)

26. Solve \( \frac{1}{2} m = -\frac{5}{2} \).
    - F \( m = -2 \)
    - G \( m = -5 \)
    - H \( m = 3 \)
    - J \( m = 2 \)

27. Solve \( -10 + h = 10 \).
    - A \( h = 0 \)
    - B \( h = 20 \)
    - C \( h = 1 \)
    - D \( h = 10 \)
1. Evaluate $\frac{x + 3}{3}$ for $x = 6$.
   A 9  C 1
   B 3  D 6

2. Evaluate $2m + 3n + 1$ for $m = -1$ and $n = 2$.
   F 9  H 5
   G 10  J 4

3. Evaluate $63 - (-4z)$ for $z = 12$.
   A 111  C 15
   B 59  D -15

4. Simplify $12x - (-17y) - 32y + (-43x)$.
   F 55x + 49y  H -31x - 60y
   G 25x - 75y  J -31x - 15y

5. Evaluate $6(t - 6)$ for $t = -3$.
   A -18  C -24
   B -54  D -9

   F -20  H -80
   G 40  J -40

7. Simplify $-2 - (3 - 5t)$.
   A 5 + 5t  C 1 + 5t
   B 5t - 5  D -1 + 5t

8. Solve $u + 47 = 238$.
   F 164  H 236
   G 191  J 285

   A -7  C 7
   B -1  D 1

10. Which algebraic expression means "44 less than a number"?
    F 44 - n  H -44 - n
    G -n + 44  J n - 44

11. Simplify $(-4) \cdot (-4) \cdot (-4) \cdot (1)$.
    A -64  C 64
    B -65  D 65

12. Simplify $-\frac{143}{13}$.
    F 13  H -11
    G 11  J -13

13. Simplify $-9 + (4 - 9)$.
    A 4  C -4
    B 14  D -14

14. Simplify $26 + (-127)$.
    F 153  H -101
    G 127  J -153

15. Simplify $15 - (-4) + 0$.
    A 11  C 19
    B -11  D -19

16. Simplify $-\frac{75}{15}$.
    F 15  H -5
    G $-\frac{75}{8 + 7}$  J 5
32. Joshua has 248 more baseball cards than Sarah, who has 63 more than Calvin. If Joshua has 752 cards, how many cards does Calvin have?

- Joshua: 752 cards
- Sarah: 752 - 248 = 504 cards
- Calvin: 504 - 63 = 441 cards

A 689  B 504  C 441  D 248

33. Solve 11 + (-8).

- Solution: 11 - 8 = 3

A -19  B -3  C 3  D 19
13. Use the Pythagorean Theorem to find the missing measure.

A 2  
B 10  
C 14  
D 24

14. What is the slope and the y-intercept of \( y = 2x + 1 \)?

F 2, 1  
H 2, -1  
G -2, 1  
J -2, -1

15. Maria wants to arrange four books on her shelf. How many ways could she arrange them?

A 24  
B 12  
C 6  
D 1

16. What are the next two terms in this sequence?

3, 7, 11, 15 ...  
F 19, 23  
H 21, 26  
G 20, 25  
J 18, 21

17. Evaluate \( 3w \) for \( w = 5 \).

A 2  
B 8  
C 15  
D 18

18. Use the formula \( A = lw \) to find the area of the rectangle.

F 15  
G 50  
H 60  
J 150

19. Which is an algebraic expression for 18 more than a number \( y \)?

A \( 18 - y \)  
C \( 18 \div y \)  
B \( y + 18 \)  
D \( 18y \)

20. Sam read \( x \) books today; he had read 15 books before that. How many total books did Sam read? Which expression represents this problem?

F \( x + 15 \)  
H \( x - 15 \)  
G \( 15x \)  
J \( 15 - x \)

21. Solve \( x + 7 = 9 \).

A \( x = 1.27 \)  
B \( x = 2 \)  
C \( x = 16 \)  
D \( x = 63 \)
CHAPTER 1

22. Which is the graph of $x + 2 > 5$?
   F
   \[\begin{array}{cccccc}
   -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 \\
   \end{array}\]
   G
   \[\begin{array}{cccccc}
   -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 \\
   \end{array}\]
   H
   \[\begin{array}{cccccc}
   -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 \\
   \end{array}\]
   J
   \[\begin{array}{cccccc}
   -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 \\
   \end{array}\]

23. Evaluate $\frac{2x + 3}{10}$ for $x = 1$.
   A $5$
   B $\frac{2}{5}$
   C $4$
   D $\frac{1}{2}$

24. Evaluate $-4m + 2n + 1$ for $m = 3$ and $n = -2$.
   F $-15$
   G $16$
   H $-7$
   J $9$

25. Evaluate $22 - 6s$ for $s = -7$.
   A $924$
   B $64$
   C $-112$
   D $-20$

26. Subtract $-11 - (-6)$.
   F $-17$
   G $-12$
   H $-5$
   J $5$

27. Simplify $(-37) \cdot (0)$.
   A $37$
   B $1$
   C $0$
   D $-37$

28. Divide $\frac{18(-5)}{3(15)}$.
   F $-90$
   G $-45$
   H $-2$
   J $45$

29. Simplify $(-3) \cdot (-3) \cdot (3)$.
   A $-27$
   B $27$
   C $-9$
   D $9$
1. What is the median of the following data?
   12, 2, 6, 10, 8, 4, 9
   A 4 C 8
   B 6 D 10

2. Find $1.2 \cdot 10^3$.
   F 12      H 1200
   G 120     J 12,000

3. What is the greatest common factor of 8 and 32?
   A 2 C 8
   B 4 D 16

4. Simplify $8 - (-2)$.
   F 6      H 10
   G -6     J -10

5. Simplify $-4 \cdot 3$.
   A -12     C -7
   B 12      D 7

6. Which of the following is the best estimate of $4.9 \cdot 5.1$?
   F 20      H 25
   G 15      J 30

7. Simplify $3\frac{3}{4} + 2\frac{1}{8}$.
   A $5\frac{7}{8}$ C $5\frac{1}{3}$
   B $5\frac{2}{3}$ D $5\frac{3}{8}$

8. Solve the proportion $\frac{4}{3} = \frac{w}{21}$.
   F $w = 20$    H $w = 63$
   G $w = 28$    J $w = 82$

9. 25 is 10% of what number?
   A 2.5      C 250
   B 25       D 2500

10. Classify the triangle according to its sides and angles.
    F isosceles, acute
    G equilateral, equiangular
    H scalene, obtuse
    J isosceles, obtuse

11. Convert 25 m to cm.
    A 25 cm    C 2500 cm
    B 250 cm   D 25,000 cm

12. Find the volume of the prism.
    F $24 \text{ in}^3$  H $480 \text{ in}^3$
    G $48 \text{ in}^3$  J $960 \text{ in}^3$
Graph the image of each figure. Label the coordinates of the image point indicated. Write the letter for that point in the box at the bottom of the page that contains these coordinates.

1. Reflect $\triangle IJK$ over the $y$-axis. Label the coordinates of $I'$.

2. Reflect $\triangle HIJ$ over the $x$-axis. Label the coordinates of $H'$.

3. Reflect $\square ABCD$ over the $y$-axis. Label the coordinates of $A'$.

4. Reflect $\triangle EFG$ over the $y$-axis, then that image over the $x$-axis. Label the coordinates of $E''$.

5. Reflect $\triangle TUV$ over the $x$-axis, then that image over the $y$-axis. Label the coordinates of $T''$.

6. Reflect $\square HIJK$ over the $x$-axis, then that image over the $y$-axis. Label the coordinates of $H''$.

7. Rotate $\triangle CDE$ $90^\circ$ clockwise about the origin. Label the coordinates of $C'$.

8. Rotate $\square HIJK$ $180^\circ$ about the origin. Label the coordinates of $H'$.

9. Rotate $\triangle BCD$ $90^\circ$ counterclockwise about the origin. Label the coordinates of $B'$.

$\begin{array}{cccccccc}
(4, -2) & (4, -4) & (4, -1) & (3, 2) & (4, -3) & (1, 2) & (3, -4) & (-2, 2) & (-4, 2) & (-3, -3) & (3, -1) & (-1, -3) & (-4, 3)
\end{array}$

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Similarity, Transformations, and Trigonometry:
Line Reflections and Rotations
How Do You Make Chicken Napoleon?

For these pairs of similar figures, find the length of each side marked with a variable. Round to the nearest tenth. Write each variable letter in the box containing the length of that side.

1. \( h \): 11 in.
   \( 15 \text{ in.} \)
   \( 14 \text{ in.} \)

2. \( a \): 5 ft
   \( 12 \text{ ft} \)
   \( 9 \text{ ft} \)

3. \( e \): 3.7 m
   \( 4.0 \text{ m} \)
   \( 6.5 \text{ m} \)

4. \( s \): 8 cm
   \( 6 \text{ cm} \)
   \( 10 \text{ cm} \)

5. \( o \): 88 ft
   \( 53 \text{ ft} \)
   \( 7.7 \text{ ft} \)

6. \( t \): 11.2 in.
   \( 5.7 \text{ in.} \)
   \( 9.1 \text{ in.} \)

7. \( u \): 48 m
   \( 64 \text{ m} \)
   \( 43 \text{ m} \)

8. \( y \): 6.2 cm
   \( 11.8 \text{ cm} \)
   \( 16.0 \text{ cm} \)

9. \( E \): AC = 30 ft
   \( AB = 13 \text{ ft} \)
   \( EB = 8 \text{ ft} \)

10. \( TR \): 15.5 in.
    \( SP = 20 \text{ in.} \)
    \( ST = 12 \text{ in.} \)

11. \( b \): 100 m
    \( 46 \text{ m} \)
    \( 75 \text{ m} \)

12. \( n \): 4.3 cm
    \( 5.1 \text{ cm} \)
    \( 2.7 \text{ cm} \)

27.9 m  25.8 in.  2.3 m  21.3 in.  13.7 cm  42.2 ft  76.7 m  9.8 cm  19.3 ft  5.3 cm  19.1 in.  15.3 in.

65.7 ft  61.3 m  71.6 ft  6.2 cm  41.5 m  8.8 cm  18.5 ft  6.7 ft  11.6 cm  17.9 in.  16.3 cm  62.7 m
When Silo Gump Graduated from College With a Degree in FLOWER GROWING, He Was Voted . . .

Complete the table of solutions for each equation. Write the letter for each ordered pair in the corresponding box below. Then graph the equation.

1. $y = x^2 - 5$

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>T</td>
</tr>
<tr>
<td>2</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>O</td>
</tr>
<tr>
<td>0</td>
<td>U</td>
</tr>
<tr>
<td>-1</td>
<td>T</td>
</tr>
<tr>
<td>-2</td>
<td>M</td>
</tr>
<tr>
<td>-3</td>
<td>S</td>
</tr>
</tbody>
</table>

(-1, -4) (2, -1) (-3, 4) (0, -5) (0, 0) (3, 4) (-2, -1) (-4, 0)

2. $y = x^2 + 4x$

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T</td>
</tr>
<tr>
<td>0</td>
<td>E</td>
</tr>
<tr>
<td>-1</td>
<td>H</td>
</tr>
<tr>
<td>-2</td>
<td>N</td>
</tr>
<tr>
<td>-3</td>
<td>T</td>
</tr>
<tr>
<td>-4</td>
<td>S</td>
</tr>
<tr>
<td>-5</td>
<td>D</td>
</tr>
</tbody>
</table>

(-1, -3) (1, 3) (-3, -3) (-5, 5) (-2, -4) (0, -2) (1, -4) (1, 5)

3. $y = x^2 + 2x - 7$

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>-5</td>
<td>O</td>
</tr>
<tr>
<td>-4</td>
<td>E</td>
</tr>
<tr>
<td>-3</td>
<td>I</td>
</tr>
<tr>
<td>-2</td>
<td>K</td>
</tr>
<tr>
<td>-1</td>
<td>Y</td>
</tr>
<tr>
<td>0</td>
<td>A</td>
</tr>
<tr>
<td>1</td>
<td>E</td>
</tr>
<tr>
<td>2</td>
<td>L</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
</tr>
</tbody>
</table>

(2, 1) (-1, 1) (3, 1) (4, 8) (-5, 8) (3, 8) (0, -5) (2, -1) (4, 11) (2, -5)

(-3, -4) (1, -4) (-1, -8) (1, -7) (-4, 3) (0, -7) (-2, -7) (-2, 11) (-4, 1)

4. $y = 2x^2 - 4x - 5$

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>E</td>
</tr>
<tr>
<td>3</td>
<td>L</td>
</tr>
<tr>
<td>2</td>
<td>D</td>
</tr>
<tr>
<td>1</td>
<td>T</td>
</tr>
<tr>
<td>0</td>
<td>C</td>
</tr>
<tr>
<td>-1</td>
<td>K</td>
</tr>
<tr>
<td>-2</td>
<td>S</td>
</tr>
</tbody>
</table>

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Functions and Linear Equations and Inequalities:
Quadratic Functions
**Boiling Water.** A pot of water at a temperature of 25°C is placed on a hot burner. The temperature of the water increases at a rate of 15° per minute until it boils at 100°C. The water continues boiling at this temperature.

1. Complete the graph to show the relationship between water temperature (y) and time since the water was placed on the burner (x).
2. How long does it take for the water to boil?
3. What is the slope of the graph for temperatures between 25°C and 100°C?
4. What is the slope of the graph after the temperature reaches 100°C?
5. Write an equation for the part of the graph that has positive slope.

**Stretching a Spring.** A spring is 8 cm long with no weight suspended from it. For each 50-gram weight, the spring stretches 3 cm until it reaches a maximum length of 26 cm. The spring remains at this length even if more weights are added.

6. Complete the graph to show the relationship between spring length (y) and weight that is added (x).
7. How much weight must be added for the spring to reach maximum length?
8. What is the slope of the graph for spring lengths between 8 cm and 26 cm?
9. Write an equation for the part of the graph that has positive slope.

**Freezing Quickly.** At 10 P.M. the temperature in Quickfrozen was 25°F. The temperature dropped at a rate of 5° per hour for 8 hours. Then, for the next 8 hours, the temperature rose at a rate of 3° per hour.

10. Complete the graph to show the relationship between temperature (y) and number of hours since 10 P.M. (x).
11. What is the slope of the graph when the temperature is falling? When rising?
12. Write an equation for the part of the graph that has negative slope.
13. Give the y- and x-intercepts of the graph.
Who Makes Rainwater Mix with Dirt?

Cross out the letters above each correct answer. Write the remaining letters in the spaces at the bottom of the page. When you write equations for graphs, use x and y as the variables.

PEAK EXPERIENCE. Two teams of backpackers are hiking on an 8900-foot mountain. Team A starts hiking up from base camp at a steady rate of elevation gain. At the same time, Team B, which had hiked up earlier, leaves the peak and starts hiking down at a steady rate of elevation loss. Use the data in the table to make a graph showing the relationship between time since the hike started and elevation for each team.

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team A elevation (ft)</td>
<td>4400</td>
<td>5000</td>
<td>5600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team B elevation (ft)</td>
<td>8900</td>
<td>8000</td>
<td>7100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Find each of the following:
   a. Rate of elevation change for Team A.
   b. Equation of the graph for Team A.
   c. Rate of elevation change for Team B.
   d. Equation of the graph for Team B.

2. When the two teams pass each other,
   a. How many hours have they been hiking?
   b. What is their elevation?

TRAINING. Two trains travel on parallel tracks. The East Train leaves Metro Station at noon and travels east at constant speed. At the same time, the West Train travels west toward Metro Station at constant speed. Make a graph showing the relationship between time since noon and distance from Metro Station for each train.

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Train distance (mi)</td>
<td>0</td>
<td>50</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Train distance (mi)</td>
<td>540</td>
<td>470</td>
<td>400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Find each of the following:
   a. Slope of the graph for the East Train.
   b. Equation of the graph for the East Train.
   c. Slope of the graph for the West Train.
   d. Equation of the graph for the West Train.

5. When the trains pass each other,
   a. How long have they been traveling?
   b. How far are they from Metro Station?

6. To the nearest hour, how long will it take the West Train to reach the station?

<table>
<thead>
<tr>
<th>RA</th>
<th>IN</th>
<th>SU</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5 h</td>
<td>50</td>
<td>y = -90x + 8900</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RA</th>
<th>IN</th>
<th>SU</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5 h</td>
<td>50</td>
<td>y = -90x + 8900</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MU</th>
<th>ST</th>
<th>CH</th>
<th>BA</th>
<th>DD</th>
<th>AW</th>
<th>AT</th>
<th>ER</th>
</tr>
</thead>
<tbody>
<tr>
<td>8000 ft</td>
<td>-900 ft/h</td>
<td>6200 ft</td>
<td>300 mi</td>
<td>y = -70x + 540</td>
<td>4.5 h</td>
<td>-700 ft/h</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RA</th>
<th>IN</th>
<th>SU</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5 h</td>
<td>50</td>
<td>y = -90x + 8900</td>
</tr>
</tbody>
</table>

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Functions and Linear Equations and Inequalities:
Linear Functions
What Happened to the Pelican Who Stuck His Head Into a Wall Socket?

Graph each equation on the grid to its right. The graph will cross a letter outside the grid. Write this letter in each box containing the exercise number.

1. \(-2x + 5y = 10\)
2. \(2x - 5y = 20\)

3. \(4x + 3y = 3\)
4. \(-8x - 6y = 30\)

5. \(x - 6y = -12\)
6. \(15x + 5y = 10\)

7. \(8x + 20y = -80\)
8. \(9x - 9y = 36\)

9. \(2x - 3y - 9 = 0\)
10. \(3x + 2y + 6 = 0\)

11. \(2x - y = 0\)
12. \(y = 4\)

*It was revolting!

Functions and Linear Equations and Inequalities:
Graphing Linear Equations
What Is It Called When a Giraffe Swallows a Toy Jet?

Write each equation in slope-intercept form, then find your answer in the rectangle below. Write the letter of the answer in the box containing the exercise number.

1. \(2x + y = 5\)
2. \(-7x + y = -2\)
3. \(4x - y = -1\)
4. \(-3x + 2y = 8\)
5. \(-x + 3y = -12\)
6. \(-5x - 2y = 18\)
7. \(8x - 3y = -9\)
8. \(9y - 2x = 0\)
9. \(7x + 2y - 3 = 0\)

\[\begin{array}{llll}
5 & y = \frac{8}{3}x - 2 & C & y = \frac{3}{2}x + 4 \\
N & y = \frac{1}{3}x - 4 & T & y = -2x + 5 \\
H & y = \frac{2}{9}x & R & y = -\frac{5}{2}x + 4 \\
E & y = -\frac{7}{2}x + \frac{3}{2} & A & y = 7x - 2 \\
O & y = \frac{3}{2}x - 9 & T & y = 4x + 1 \\
& E & y = -\frac{5}{2}x - 9 & \\
\end{array}\]

Write each equation in slope-intercept form, then use the slope and y-intercept to graph it. The graph will cross a letter outside the grid. Write this letter in the box containing the exercise number.

10. \(2x + y = 1\)  
11. \(-3x + 2y = -4\)  
12. \(x + 3y = 9\)  
13. \(3x - 5y = 20\)  
14. \(3x - y = 1\)  
15. \(5x + 4y = 0\)

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Functions and Linear Equations and Inequalities:  
Graphing Linear Equations
What Happened to the Little Boy Who Swallowed a Silver Dollar?

Use the slope and y-intercept to graph each equation. The graph, if extended, will cross a letter outside the grid. Look for this letter in the string of letters at the bottom of the page and cross it out each time it appears. When you finish, write the remaining letters in the rectangle at the bottom of the page.

1. \( y = \frac{2}{3}x + 1 \)
2. \( y = -\frac{2}{3}x + 1 \)
3. \( y = \frac{3}{4}x - 2 \)
4. \( y = 2x - 3 \)
5. \( y = -3x - 1 \)
6. \( y = -\frac{1}{5}x + 2 \)
7. \( y = \frac{7}{4}x - 4 \)
8. \( y = -x + 3 \)
9. \( y = 4x \)

R I N D S O C K W H I F R A N U L I G E Y W E D S T

answer to puzzle:
Slopes and Intercepts

Find the slope and intercepts for each line.

1. slope ____
2. x-intercept ____
3. y-intercept ____

4. slope ____
5. x-intercept ____
6. y-intercept ____

7. slope ____
8. x-intercept ____
9. y-intercept ____

Answer the questions for each graph. Be sure to include a unit of measurement with each answer.

10. How much money had been saved at time 0?
11. What was the rate of saving ($/mo)?

12. What was the distance from home at time 0?
13. What was the rate of speed (mph)?

14. What was the height of the tree at time 0?
15. What was the rate of growth (ft/yr)?

16. What was the temperature at sea level? At 20,000 ft?
17. At what rate did the temperature change (°F/1000 ft)?
18. At about what elevation was the temperature 0°F?
19. What would the temperature be outside a jet flying at 40,000 ft?

20. What was the rate of speed from 0 to 3 h?
21. What was the rate of speed from 3 to 4 h?
22. What was the rate of speed from 4 to 9 h?
23. What was the overall average rate of speed (total distance divided by total time)?
What Did the Scout Say After Fixing the Little Old Lady’s Bicycle Horn?

For each exercise, draw a line through the two given points. Find the slope of this line. Write the letter of the exercise in the box containing the slope.

A (1, 1) (4, 3)  E (-1, 2) (-4, 4)  D (-2, -5) (2, -3)
I (-4, -3) (-1, 3)  E (1, 0) (3, -4)  P (2, 4) (0, -3)
E (4, -5) (-1, -2)  B (-6, -6) (3, 6)  R (0, 2) (5, -3)
E (-6, 4) (-3, -5)  P (-3, 0) (3, 1)  R (-2, -4) (5, -4)

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Functions and Linear Equations and Inequalities:
Slopes and Intercepts
Why Was the Baby Ant Confused?

Fill in each blank with one of the choices to the right. The circled letter to the left of each blank goes in the box containing the number of the answer.

The Coordinate Plane
1. The __________ plane has two number lines that intersect at a point called the __________. The horizontal number line is called the __________. The vertical number line is called the __________. The two axes divide the coordinate plane into four parts called __________. The location of a point in the coordinate plane is given using an __________ of numbers. The first number is the __________. The second number is the __________. Label the origin, axes, and quadrants in the figure at the top of the answer column.

Equations in Two Variables
For an equation with two variables, x and y, a pair of values (x,y) that make the equation true is called a __________ of the equation. Each solution is an __________. The value of x is written __________; the value of y is written __________. Each solution can be represented as a __________ in the coordinate plane. The set of all points representing solutions is called the __________ of the equation. An equation in two variables has an __________ number of solutions, so there is an infinite number of __________ in the graph.

Linear Equations
If the graph of an equation in two variables is a straight line, the equation is a __________ equation. Every solution can be represented by a __________ on the line. For example, the equation y = 2x + 5 is a linear equation because its graph is a __________. One solution of this equation is __________. 2x + 3y = 90 is a linear equation because its __________ is a line. In a linear equation, the highest power of either variable is the __________ power.
What Helps Chicks Get Out of Their Shells?

Complete the table of solutions for each equation. Then graph the solutions and draw a line through them. The line, if extended, will cross a letter outside the grid. Write this letter in each box containing the exercise number.

1. \( y = 3x - 1 \)
   | \( x \) | \( y \) |
   | 3     |     |
   | 2     |     |
   | -2    |     |
   | 0     |     |

2. \( y = -2x + 3 \)
   | \( x \) | \( y \) |
   | 5      |     |
   | -3     |     |
   | 2      |     |
   | 0      |     |

3. \( y = -x - 2 \)
   | \( x \) | \( y \) |
   | 6      |     |
   | -5     |     |
   | -2     |     |
   | 0      |     |

4. \( y = \frac{1}{2}x + 4 \)
   | \( x \) | \( y \) |
   | 4      |     |
   | 6      |     |
   | -2     |     |
   | 0      |     |

5. \( y = 7 - 2x \)
   | \( x \) | \( y \) |
   | 2      |     |
   | -1     |     |
   | 5      |     |
   | 0      |     |

6. \( y = -\frac{2}{3}x + 1 \)
   | \( x \) | \( y \) |
   | 6      |     |
   | -6     |     |
   | 3      |     |
   | 0      |     |
When Should You Stop at Green and Go at Red?

Choose the best graph for the given situation. Copy the graph and label the axes with the variables given in parentheses (the first variable goes on the y-axis; the second variable on the x-axis). Then write the letter of your choice in each box containing the exercise number.

1. Karina walked from home to the library, did some homework, then walked back. (distance from home/time)

2. Karina walked from home to the library, did some homework, then walked back. (speed/time)

3. When jogging, Dash starts slowly, builds up to a comfortable speed, then slows down near the end. (distance/time)

4. When jogging, Dash starts slowly, builds up to a comfortable speed, then slows down near the end. (speed/time)

5. Mr. Mustard walked to the subway station, waited a few minutes, then got on a train. (distance/time)

6. Mr. Mustard walked to the subway station, waited a few minutes, then got on a train. (speed/time)

7. Kevin carried a box of school yearbooks from the office to his classroom. (weight of box/number of books in box)

8. Every week the plant in our classroom is taller than the week before. (height of plant/number of weeks)

9. From the ocean surface, a submarine dives steadily deeper until leveling off. (pressure on submarine/elevation)

10. An airliner takes off and climbs steadily higher until leveling off. (temperature outside airliner/elevation)

11. Each month the baby hippo weighed twice as much as it had the month before. (weight/time)

12. Each hour there was half as much medication in the blood as there had been an hour before. (medication/time)
SCATTERPLOTS

Construct a scatter plot for each set of data. Describe what kind of relationship, if any, is shown.

1. Grams of fat and calories for individual servings of items sold at a McDonald’s® restaurant.

<table>
<thead>
<tr>
<th>Item</th>
<th>Fat (g)</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamburger</td>
<td>9</td>
<td>260</td>
</tr>
<tr>
<td>Cheeseburger</td>
<td>13</td>
<td>320</td>
</tr>
<tr>
<td>Big Mac</td>
<td>31</td>
<td>560</td>
</tr>
<tr>
<td>Quarter Pounder</td>
<td>21</td>
<td>420</td>
</tr>
<tr>
<td>Arch Deluxe with Bacon</td>
<td>34</td>
<td>590</td>
</tr>
<tr>
<td>Grilled Chicken Deluxe</td>
<td>20</td>
<td>440</td>
</tr>
<tr>
<td>French Fries (large)</td>
<td>22</td>
<td>450</td>
</tr>
<tr>
<td>Chicken McNuggets (9 pc)</td>
<td>26</td>
<td>430</td>
</tr>
<tr>
<td>Garden Salad</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>Grilled Chicken Salad</td>
<td>2</td>
<td>120</td>
</tr>
<tr>
<td>Ranch Dressing (1 pkg)</td>
<td>21</td>
<td>230</td>
</tr>
<tr>
<td>Egg McMuffin</td>
<td>12</td>
<td>290</td>
</tr>
<tr>
<td>Sausage McMuffin</td>
<td>23</td>
<td>360</td>
</tr>
<tr>
<td>Sausage Biscuit with Egg</td>
<td>37</td>
<td>440</td>
</tr>
<tr>
<td>Hash Browns</td>
<td>8</td>
<td>130</td>
</tr>
<tr>
<td>Lowfat Apple Bran Muffin</td>
<td>3</td>
<td>300</td>
</tr>
<tr>
<td>Vanilla Shake (small)</td>
<td>9</td>
<td>360</td>
</tr>
<tr>
<td>Baked Apple Pie</td>
<td>13</td>
<td>260</td>
</tr>
</tbody>
</table>

2. Weight and EPA fuel economy (highway) for sport-utility vehicles sold in a recent model year.

<table>
<thead>
<tr>
<th>Make/Model</th>
<th>Weight (lb)</th>
<th>Fuel Economy (mpg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chevrolet Blazer</td>
<td>4,225</td>
<td>20</td>
</tr>
<tr>
<td>Chevrolet Tahoe</td>
<td>5,335</td>
<td>19</td>
</tr>
<tr>
<td>Dodge Durango</td>
<td>4,710</td>
<td>17</td>
</tr>
<tr>
<td>Ford Excursion</td>
<td>6,694</td>
<td>12</td>
</tr>
<tr>
<td>Ford Explorer</td>
<td>4,425</td>
<td>19</td>
</tr>
<tr>
<td>GMC Suburban</td>
<td>5,640</td>
<td>18</td>
</tr>
<tr>
<td>Honda CR-V</td>
<td>3,155</td>
<td>25</td>
</tr>
<tr>
<td>Isuzu Rodeo</td>
<td>3,935</td>
<td>20</td>
</tr>
<tr>
<td>Jeep Grand Cherokee</td>
<td>3,970</td>
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<td>Mercury Mountaineer</td>
<td>4,440</td>
<td>19</td>
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<tr>
<td>Nissan Pathfinder</td>
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<tr>
<td>Subaru Forester</td>
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<td>16</td>
</tr>
<tr>
<td>Toyota RAV4</td>
<td>3,000</td>
<td>26</td>
</tr>
</tbody>
</table>
Why Did the Flying Saucer Have "U.F.O." Printed On It?

For each exercise, plot the three given points, then draw a line through them. The line, if extended, will cross a letter outside the grid. Write this letter in each box containing the exercise number.

1. (4, 5) (-2, -1) (0, 1)
2. (-4, 3) (2, -1) (5, -3)
3. (3, 0) (5, -6) (2, 3)
4. (-5, 2) (-2, 3) (1, 4)
5. (0, -2) (-5, -5) (5, 1)
6. (3, 0) (5, -6) (2, 3)

7. (-1, -2) (-7, -6) (8, 4)
8. (-3, 6) (0, 0) (3, -6)
9. (2, -2) (-4, 0) (5, -3)
10. (0, -6) (4, 6) (2, 0)
11. (-3, 5) (0, 3) (-6, 7)
12. (-2, -5) (-7, -5) (8, -5)
What Did the Skeleton Order With His Dinner?

Solve each inequality, then find your answer in the answer column. Write the letter of the correct answer in the box containing the exercise number.

1. \(-2x + 7 < 11\)  \hspace{1cm} 2. \(\frac{x}{4} - 9 \geq -10\)

3. \(-18 \geq 5x - 8\)  \hspace{1cm} 4. \(-\frac{1}{2}x + 5 > 3\)

5. \(22 \leq -6n + 1\)  \hspace{1cm} 6. \(-\frac{n}{15} - 4 \geq -4\)

7. Tonka weighs 150 lb. He is loading a freight elevator with identical 67-pound boxes. The elevator can carry no more than 2000 lb. If Tonka rides up with the boxes, how many boxes can be loaded on the elevator?

8. \(0.8y + 30 > -24\)  \hspace{1cm} 9. \(10 < -\frac{1}{7}y - 2\)

10. Suppose you are a salesperson for the Acme Dynamite Company. Each month you earn $400 plus one sixth of your sales. What amount must you sell this month to earn more than $3000?

11. \(65 \leq -20w - 11\)  \hspace{1cm} 12. \(9 - \frac{w}{10} \geq 2\)

13. The Micron Middle School Spring Carnival charges $7 for admission plus $0.75 for each ride ticket. How many ride tickets can you buy if you want to spend no more than $20?
What Do You Call Two Birds Relaxing In the Midday Sun?

Find the equation of the line through the given point with the given slope. Cross out the letters next to each correct answer. For each letter pair you DON'T cross out, write the uppercase letter in the box with the lowercase letter.

In Exercises 1-5, write your answer in point-slope form.

1. \((3, -4); m = 2\) \(\text{o} \cdot \text{D} y = \frac{7}{2} (x - 8)\)
2. \((-1, 5); m = -\frac{4}{3}\) \(\text{g} \cdot \text{N} y + 2 = -\frac{1}{6} (x - 9)\) \(\text{i} \cdot \text{R} y + 4 = 2(x - 3)\)
3. \((8, 0); m = \frac{7}{2}\) \(\text{b} \cdot \text{L} y + 6 = -3x\) \(\text{c} \cdot \text{A} y + 5 = -\frac{4}{3}(x + 1)\)
4. \((-2, -9); m = -\frac{1}{6}\) \(\text{j} \cdot \text{E} y - 5 = -\frac{4}{3} (x + 1)\) \(\text{l} \cdot \text{I} y - 6 = 3x\)
5. \((0, -6); m = -3\) \(\text{n} \cdot \text{S} y = -\frac{7}{2}(x + 8)\) \(\text{d} \cdot \text{T} y + 9 = -\frac{1}{6}(x + 2)\)

In Exercises 6-10, write your answer in slope-intercept form.

6. \((8, 5); m = \frac{1}{4}\) \(\text{f} \cdot \text{I} y = -\frac{1}{2} x - \frac{9}{2}\)
7. \((4, -1); m = -2\) \(\text{i} \cdot \text{F} y = \frac{5}{3} x + 12\) \(\text{k} \cdot \text{T} y = -2x + 7\)
8. \((-6, 2); m = \frac{5}{3}\) \(\text{j} \cdot \text{O} y = -2x + 3\) \(\text{m} \cdot \text{N} y = \frac{5}{3} x + 7\)
9. \((-7, -4); m = -\frac{1}{2}\) \(\text{c} \cdot \text{R} y = 5x - \frac{15}{2}\) \(\text{b} \cdot \text{B} y = 5x - 12\)
10. \(\left(\frac{3}{2}, 0\right); m = 5\) \(\text{h} \cdot \text{E} y = \frac{1}{4} x + 3\) \(\text{a} \cdot \text{S} y = -\frac{1}{2} x - \frac{15}{2}\)

In Exercises 11-15, write your answer in standard form with integer coefficients.

11. \((-5, 2); m = \frac{2}{5}\) \(\text{k} \cdot \text{L} -2x + 5y = 20\)
12. \((-6, -1); m = -4\) \(\text{e} \cdot \text{K} 3x - 8y = 20\) \(\text{d} \cdot \text{S} -9x - 4y = -15\)
13. \((3, -3); m = -\frac{3}{8}\) \(\text{a} \cdot \text{E} 4x + y = -25\) \(\text{h} \cdot \text{G} y = -9\)
14. \(\left(0, \frac{1}{2}\right); m = \frac{9}{4}\) \(\text{k} \cdot \text{B} -2x - 5y = 15\) \(\text{i} \cdot \text{R} -4x + y = -9\)
15. \(\left(\frac{16}{3}, -9\right); m = 0\) \(\text{d} \cdot \text{T} 3x + 8y = -15\) \(\text{c} \cdot \text{P} -9x + 4y = 2\)
Why Did the Orchestra Get an “R” Rating?

Write the equation in the form indicated. Circle the letter next to the correct equation, then write this letter in each box containing the exercise number.

In Exercises 1-7, write the equation in slope-intercept form.

1. \( y + 8 = 3(x + 2) \)  
   - K \( y = 3x - 6 \)  
   - H \( y = 3x - 2 \)

2. \( y - 5 = \frac{1}{2}(x + 4) \)  
   - T \( y = \frac{1}{2}x - 1 \)  
   - D \( y = \frac{1}{2}x + 7 \)

3. \( y - 9 = -5(x - 2) \)  
   - A \( y = -5x + 19 \)  
   - E \( y = -5x - 1 \)

4. \( y + 1 = \frac{2}{3}(x - 12) \)  
   - Y \( y = \frac{2}{3}x - 4 \)  
   - U \( y = \frac{2}{3}x - 9 \)

5. \( y - 2 = \frac{7}{4}(x + 1) \)  
   - I \( y = \frac{7}{4}x + \frac{15}{4} \)  
   - B \( y = \frac{7}{4}x + \frac{3}{4} \)

6. \( y - 4 = -\frac{1}{5}(x - 3) \)  
   - T \( y = -\frac{1}{5}x + \frac{23}{5} \)  
   - S \( y = -\frac{1}{5}x + \frac{8}{5} \)

7. \( y - 7 = -\frac{8}{3}(x + 2) \)  
   - P \( y = -\frac{8}{3}x - \frac{29}{3} \)  
   - V \( y = -\frac{8}{3}x + \frac{5}{3} \)

In Exercises 8-14, write the equation in standard form with integer coefficients.

8. \( y = 2x + 9 \)  
   - M \( -2x + y = 9 \)  
   - L \( 2x - y = 9 \)

9. \( y = \frac{4}{3}x - 1 \)  
   - R \( -4x - 3y = 1 \)  
   - N \( -4x + 3y = -3 \)

10. \( y = -\frac{5}{8}x + 3 \)  
    - S \( 5x - 8y = 15 \)  
    - C \( 5x + 8y = 24 \)

11. \( y = -4x - 15 \)  
    - L \( 4x + y = -15 \)  
    - G \( -4x + y = 15 \)

12. \( y = \frac{3}{10}x + 8 \)  
    - B \( -3x - 10y = 60 \)  
    - X \( -3x + 10y = 80 \)

13. \( y = -\frac{16}{5}x + \frac{4}{5} \)  
    - O \( 16x + 5y = 4 \)  
    - E \( -16x - 5y = 4 \)

14. \( y = \frac{7}{4}x - \frac{1}{8} \)  
    - R \( 14x + 8y = -8 \)  
    - S \( -14x + 8y = -1 \)

extra: Comparing Slopes

1. Which of these two graphed lines has the greater slope?
2. What is the slope of the speeding bullet graph?
3. What is the slope of the Superman graph?
4. Which is faster, Superman or a speeding bullet?

Linear Equations and Their Graphs: Changing the Form of a Linear Equation

7.15
What Do Man-Eating Fish Use For Barbeques?

Graph each equation on the grid to its right. The graph will cross a letter outside the grid. Find this letter in the string of letters and cross it out each time it appears. When you finish, write the remaining letters in the space below.

1. \(-2x + 5y = 15\)  
2. \(2x + y + 1 = 0\)

3. \(-x - 6y = 30\)  
4. \(9x = 9y + 36\)

5. \(5x - 3y = 0\)  
6. \(y - 4 = 0\)

7. \(4x + 5y = 5\)  
8. \(3x - 8 = y - 4\)

9. \(20y - 60 = 5x\)  
10. \(-2(x + y) = 2 + 5x\)

11. \(x + y = 5 - x\)  
12. \(x + y = y - 5\)

---

**BFNISTHEMBATPDNRUKCYGOITEAPLD**

**EXTRA: Planning for a Backpacking Trip**

Trex is mixing raisins and peanuts to make trail mix. Raisins have 60 calories/oz and peanuts have 150 calories/oz. Trex wants to have a total of 1200 calories.

Let \(x\) = number of ounces of raisins
Let \(y\) = number of ounces of peanuts

Write an equation stating that the total number of calories is 1200. Then graph the equation.

What are some different combinations of raisins and peanuts that Trex could use?

Linear Equations and Their Graphs:
Graphing a Line Given Its Equation
What Did the Electrician Say To His Daughter When She Came Home at 2 A.M.?

Write each equation in slope-intercept form, then find your answer in the rectangle below. Write the letter of the answer in the box containing the exercise number.

1. $-6x + 3y = -9$
2. $5x - y = 1$
3. $2y - 3x = 10$
4. $2y + x = 14$
5. $x - 4y - 8 = 0$
6. $3y + 18 = -8x + 3$
7. $9x - 2y = 7$
8. $x + 5y = 8x - 20$
9. $-2(3y - 1) - x = 0$

- $y = \frac{3}{2}x - 4$
- $y = -\frac{1}{2}x + 7$
- $y = \frac{9}{2}x - \frac{7}{2}$
- $y = 2x - 3$
- $y = -\frac{8}{3}x - 5$
- $y = 5x - 1$
- $y = -\frac{8}{3}x + 7$
- $y = -\frac{1}{6}x + \frac{1}{3}$
- $y = \frac{7}{5}x - 4$
- $y = \frac{1}{4}x + 5$
- $y = \frac{3}{2}x + 5$
- $y = \frac{1}{4}x - 2$

Write each equation in slope-intercept form, then use the slope and y-intercept to graph it. The graph will cross a letter outside the grid. Write this letter in the box containing the exercise number.

10. $2x - y = -1$
12. $4y + 20 = 5x$
14. $7x - 1 = 3y + 8$
11. $3y + 2x + 12 = 0$
13. $3(x - 1) = 2x - y$
15. $9x + 18y = 0$

Linear Equations and Their Graphs:
Writing an Equation in Slope-Intercept Form, Then Drawing the Graph

7.13
What Happened to the Guy Who Fell Into an Upholstery Machine?

Use the slope and y-intercept to graph each equation. The graph, if extended, will cross a letter. Write this letter in the box containing the exercise number.

1. \( y = \frac{3}{4} x - 2 \)
2. \( y = -2x + 1 \)
3. \( y = -\frac{5}{2} x - 4 \)
4. \( y = \frac{1}{3} x + 4 \)
5. \( y = 3x - 1 \)
6. \( y = -\frac{7}{4} x - 5 \)
7. \( y = -\frac{1}{2} x \)
8. \( y = -4x + 3 \)
9. \( y = \frac{8}{3} x - 5 \)
10. \( y = x + 3 \)
11. \( y = -x - 4 \)
12. \( y = x \)

13. The temperature is -6°C and rising at a rate of 2º per hour.
14. The temperature is 12°C and dropping at a rate of 3º per hour.
15. \( y = 5 \)
16. \( x = -2 \)
17. \( y = -1 \)
18. \( x = 3 \)

Linear Equations and Their Graphs:
Graphing a Line Given Its Equation in Slope-intercept Form
How Did the Light Dress Up For the Costume Party?

For each exercise, draw the line indicated and write its equation. Find your answer in the answer column and cross out the letter next to it. When you finish, the answer to the title question will remain.

1. Equation of $\overline{AB}$
2. Equation of $\overline{CD}$
3. Equation of $\overline{EF}$
4. Equation of $\overline{GH}$
5. Equation of $\overline{JK}$
6. Equation of $\overline{GL}$
7. Equation of $\overline{MN}$
8. Equation of $\overline{OP}$
9. Equation of $\overline{QR}$
10. Equation of $\overline{ST}$
11. Equation of $\overline{UV}$
12. Equation of $\overline{SW}$
What Does Alabama Have That Most Students Would Like To Have?

For each exercise, write an equation expressing direct variation. Find your equation in the answer column. Then use your equation to solve the problem. Write the letter of the equation in the box above your solution.

1. \( y \) varies directly as \( x \), and \( y = 10 \) when \( x = 2.5 \). Find \( y \) if \( x = 18 \).

2. \( y \) varies directly with \( x \), and \( y = 120 \text{ lb} \) when \( x = 50 \text{ lb} \). Find \( y \) if \( x = 40 \text{ lb} \).

3. \( y \) varies directly as \( x \), and \( y = 9 \text{ cm} \) when \( x = 15 \text{ cm} \). Find \( y \) if \( x = 80 \text{ cm} \).

4. \( y \) is directly proportional to \( x \), and \( y = 45 \) when \( x = 6000 \). Find \( y \) if \( x = 81000 \).

5. The amount of money earned on a job is directly proportional to the number of hours worked. If \$76\) is earned for 8 h of work, how much is earned for 34 h of work?

6. The height that a ball bounces varies directly with the height from which it is dropped. A certain ball bounces 22 cm when dropped from a height of 50 cm. How high will the ball bounce if dropped from a height of 90 cm?

7. The amount of water wasted from a leaking faucet is directly proportional to the time that the faucet leaks. If 96 oz of water are wasted in 30 min, how much water is wasted in 5 min?

8. The number of pages that Klunk can read varies directly with the time he spends reading. If he reads 13 pages in 25 min, how many pages can he read in 2 h?

9. The weight of an object on another planet varies directly with its weight on Earth. A person who weighs 150 lb on Earth would weigh 399 lb on Jupiter. How much would a 180-lb person weigh on Jupiter? Round to the nearest pound.

10. The weight of water in a person’s body varies directly as his/her body weight. The body of a 170-lb person contains about 119 lb of water. How much water is in the body of a person who weighs 120 lb?

11. The number of ceramic tiles needed to cover a wall is directly proportional to the area of the wall. If 180 tiles are needed for 100 square feet of wall area, how many tiles are needed for a wall that measures 9 ft by 30 ft?
Why Did the Teacher Have an Automobile Accident?

For each exercise, write the letter of the answer in each box containing the exercise number.

Part 1. For the data in the table, tell whether \( y \) varies directly with \( x \).
If it does, write an equation for the direct variation.

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<td>-16</td>
</tr>
</tbody>
</table>

Part 1 Answers
I. \( y = -4.5x \)
D. \( y = 3x \)
F. \( y = -4x \)
A. \( y = 0.6x \)
H. not direct variation

Part 2. Write an equation expressing direct variation.

Then graph the equation.

5. \( y \) varies directly as \( x \), and \( y = 14 \text{ cm} \) when \( x = 8 \text{ cm} \).

6. \( y \) varies directly as \( x \), and \( y = 9 \text{ lb} \) when \( x = 72 \text{ lb} \).

7. \( y \) varies directly with \( x \), and \( y = 60 \text{ mi} \) when \( x = 12 \text{ mi} \).

8. \( y \) varies directly with \( x \), and \( y = 40 \text{ in.} \) when \( x = 15 \text{ in.} \).

9. \( y \) is directly proportional to \( x \), and \( y = 516 \text{ when} \ x = 16 \).

10. \( y \) is directly proportional to \( x \), and \( y = 8 \text{ g} \) when \( x = 28 \text{ g} \).

11. \( y \) is directly proportional to \( x \), and \( y = 180 \text{ when} \ x = -30 \text{.} \)

12. \( y \) varies directly as \( x \), and \( y = 95 \text{ kg} \) when \( x = 10 \text{ kg} \).

13. The amount of jelly, \( y \), is directly proportional to the amount of peanut butter, \( x \). Write an equation if \( y = 6 \text{ oz} \) when \( x = 10 \text{ oz} \).

14. The circumference, \( y \), of a circle varies directly with the diameter, \( x \). Write an equation if \( y = 220 \text{ ft} \) when \( x = 70 \text{ ft} \).

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Linear Equations and Their Graphs:
Direct Variation Equations and Graphs

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7.9
What Is Used To Repair Big, Brass Band Instruments?

Cross out the letter pair next to each correct answer. For each letter pair that you DON'T cross out, write the upper case letter in the box containing the lower case letter.

In Exercises 1-6, find the slope of \( \overline{AB} \).

1. \( \text{a} \) \( \frac{3}{2} \)  
2. \( \text{b} \) \( \frac{3}{5} \)  
3. \( \text{c} \) \( \frac{2}{3} \)  
4. \( \text{d} \) \( -2 \)  
5. \( \text{e} \) \( 7 \)  
6. \( \text{f} \) \( -\frac{1}{5} \)

In Exercises 7-18, find the slope of the line that passes through the two given points.

7. \((5,1); (8,3)\)  
8. \((6,3); (1,4)\)  
9. \((-2,-2); (5,7)\)  
10. \((1,-6); (9,-8)\)  
11. \((-3,7); (-10,0)\)  
12. \((-9,4); (-6,-4)\)  
13. \((0,-3); (-2,7)\)  
14. \((2,8); (0,3)\)  
15. \((-6,4); (6,-5)\)  
16. \((-5,-9); (-1,-1)\)  
17. \((-2,11); (7,15)\)  
18. \((-5,6); (0,0)\)

Answers:

1-6: \( \text{i} \), \( \text{O} \), \( \text{e} \), \( \text{U} \), \( \text{g} \), \( \text{R} \), \( \text{a} \), \( \text{T} \), \( \text{b} \), \( \text{A} \), \( \text{j} \), \( \text{V} \), \( \text{d} \), \( \text{L} \), \( \text{l} \), \( \text{E} \), \( \text{h} \), \( \text{N} \)

7-12: \( \text{f} \), \( \text{P} \), \( \text{k} \), \( \text{U} \), \( \text{a} \), \( \text{S} \), \( \text{c} \), \( \text{N} \), \( \text{d} \), \( \text{B} \), \( \text{g} \), \( \text{A} \), \( \text{i} \), \( \text{G} \), \( \text{h} \), \( \text{N} \), \( \text{m} \), \( \text{E} \)

13-18: \( \text{j} \), \( \text{L} \), \( \text{h} \), \( \text{R} \), \( \text{d} \), \( \text{T} \), \( \text{f} \), \( \text{B} \), \( \text{c} \), \( \text{T} \), \( \text{d} \), \( \text{S} \), \( \text{m} \), \( \text{D} \), \( \text{j} \), \( \text{O} \)

Linear Equations and Their Graphs: Finding Slope Given Two Points On the Line (Not Using the Graph)
What Did the Inventor of the 10-Ton Truck So Often Say?

For each exercise, draw a line through the two given points. Find the slope of this line. Write the letter of the exercise in the box containing the slope.

B (4, 4) E (2, 0) O (1, -3) I (-1, -3) E (-4, 3) O (-3, 0)
(1, 2) (-4, 4) (-3, -4) (2, 3) (-2, -1) (-1, 5)

D (5, 6) L (-5, 2) G (4, 5) S (2, -3)
(5, -1) (2, -1) (0, -3) (-2, 4) (-5, -3)

Linear Equations and Their Graphs:
Finding Slope Given Two Points On the Line (Using the Graph)

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7.7