Cumulative Test 1

Evaluate the expression.
1. \(7 + 6^2 ÷ 3\)  
2. \(4 \cdot 5^2 - 18\)  
3. \(4[32 - (17 - 12)^2]\)  
4. \(\frac{2}{3}(5 + 3)^2 - 31\)  
5. \(3(5m - 4)\) when \(m = -2\)  
6. \(9x^2 - 4\) when \(x = 3\)

Write an algebraic expression, an equation, or an inequality.
7. The sum of 5 times a number \(x\) and 17  
8. The difference of 21 and the product of 5 and a number \(y\) is less than 7.  
9. The quotient of 75 and the quantity of a number \(z\) and 2 is 25.

Check whether the given number is a solution of the equation or inequality.
10. \(5c - 13 = 12; 2\)  
11. \(21 - 2d < 7; 6\)  
12. A family goes to an amusement park. Adult tickets cost $21. Children under 10 years of age pay $15. Write an algebraic expression for the total cost. Then find the total cost of 4 adult tickets and 3 children’s tickets.

Perform the indicated operation. Write the answer with the correct number of significant digits.
13. \(17.497 \text{ km} + 20.82 \text{ km}\)  
14. \(47.725 \text{ ft}^2 - 8.3 \text{ ft}\)

Approximate the square root to the nearest integer.
15. \(\sqrt{125}\)  
16. \(\sqrt{200}\)  
17. \(-\sqrt{47}\)

18. Order the numbers from least to greatest: \(-1.6, \sqrt{4}, 0, 3.1, -\sqrt{5}\).

Solve the equation.
19. \(\frac{m}{6} = 8\)  
20. \(17 = 4x - 7\)  
21. \(9 - \frac{n}{3} = 28\)  
22. \(16w - 10w + 13 = -5\)  
23. \(4h - 13 = 7h + 2\)  
24. \(\frac{2}{3}(25z - 30) = \frac{3}{4}(12z + 16)\)

The perimeter \(P\) of a rectangle is given by the formula \(P = 2l + 2w\) where \(l\) is the length and \(w\) is the width.
25. Solve the formula for \(l\).
26. Use the rewritten formula to find the length of a rectangle with a width of 9 inches and a perimeter of 40 inches.
Cumulative Test 1  continued

Solve the proportion.

27. \( \frac{x}{8} = \frac{12}{32} \)

28. \( \frac{12}{3w} = \frac{36}{63} \)

29. \( \frac{21}{15} = \frac{3k - 2}{5} \)

30. A scale drawing for a new city library shows a rectangular Children’s Reading Room with a length of 5\( \frac{1}{4} \) inches and a width of 3\( \frac{1}{2} \) inches. The scale on the drawing is 1 inch : 4 feet. What will be the actual length and width of the room when the library is built?

Write the equation so that \( y \) is a function of \( x \).

31. \(-12x + 3y = 15\)

32. \(5x = -10y + 30\)

Find the slope of the line that passes through the points.

33. \((-7, 3)\) and \((3, 8)\)

34. \((-2, -9)\) and \((-5, 6)\)

Identify the slope and y-intercept of the line with the given equation.

35. \(y = -\frac{4}{5}x + 9\)

36. \(4x - 7y = 21\)

Tell whether the equation represents direct variation. If so, identify the constant of variation.

37. \(2x - \frac{1}{5}y = 0\)

38. \(3y = 5 - 4x\)

Graph the equation.

39. \(y = \frac{1}{4}x - 5\)

40. \(2x + 5y = 20\)

41. The price \( p \) (in dollars) varies directly with the number of admissions to a museum. The museum charges $12 for 5 student admissions. Write a direct variation equation that relates \( p \) and \( a \). Then find the total admission price for 30 students.
Cumulative Test 1  continued

42. Graph the function \( h(x) = x - 4 \). Compare the graph with the graph of \( f(x) = x \).

\[ \begin{array}{|c|c|c|c|c|}
\hline
x & -3 & -1 & 1 & 3 \ \\
\hline
y & -3 & -1 & 1 & 3 \ \\
\hline
\end{array} \]

Write an equation in slope-intercept form of the line with the given characteristics.

43. slope 3; \( y \)-intercept 5
44. \( m = -2 \); passes through \((-1, 5)\)
45. passes through \((3, 2)\) and \((-5, -8)\)
46. perpendicular to \( y = -3x + 1 \); passes through \((2, 2)\)
47. slope \(-\frac{3}{2}\); \( y \)-intercept 1
48. \( m = 4 \); passes through \((-3, -2)\)
49. passes through \((-2, 4)\) and \((-5, 7)\)
50. parallel to \( y = \frac{3}{5}x - \frac{1}{5} \); passes through \((-2, 0)\)

51. Write an equation in standard form of the line shown.

52. Make a scatter plot of the data in the table below. Draw a line of fit. And then write an equation of the line.

<table>
<thead>
<tr>
<th>( x )</th>
<th>0</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>-2</td>
<td>8</td>
<td>14</td>
<td>24</td>
<td>36</td>
</tr>
</tbody>
</table>
Cumulative Test 1  

Solve the inequality, if possible. Graph your solution.

53. \( x + 5.1 \geq 9.4 \)  
\[ x \geq 4.3 \]

54. \( \frac{x}{7} < -3 \)  
\[ x < -21 \]

55. \( 5 + 2x \leq -4x + 23 \)  
\[ x \leq 3 \]

56. \( -5 < 3x + 1 < 4 \)  
\[ -2 < x < 1 \]

57. \( -2x > 9 \) or \( 4x + 7 > 9 \)  
\[ x < -4.5 \] or \[ x > 0.5 \]

58. \( |x + 1| - 3 > 8 \)  
\[ |x + 1| > 11 \]

Solve the equation, if possible.

59. \( 3|x - 2| + 2 = 17 \)  
\[ x = 3 \] or \[ x = -2 \]

60. \( 7|4x + 2| + 6 = 4 \)  
\[ x = -0.6 \]

61. The sum of the weight \( w \) (in pounds) of passengers \( p \) and gear \( g \) in a canoe can be no more than 500 pounds. Write and graph an inequality that describes the possible weights of the people and the gear. Identify and interpret one of the solutions.

\[ w = p + g \leq 500 \]

Solve the linear system.

62. \( 2x + 5y = -16 \) \( 6x + y = -20 \)  
\[ \begin{align*} x &= -4 \\ y &= -8 \end{align*} \]

63. \( 7x + 4y = 26 \) \( 3x - 8y = -18 \)  
\[ \begin{align*} x &= 2 \\ y &= 4 \end{align*} \]

64. \( 5x + 3y = 19 \) \( 2y = 5x + 21 \)  
\[ \begin{align*} y &= 11 \\ x &= 2 \end{align*} \]

65. \( 3x - 9y = 3 \) \( 5x - 8y = 12 \)  
\[ \begin{align*} y &= -1 \\ x &= 3 \end{align*} \]

Tell whether the linear system has one solution, no solution, or infinitely many solutions.

66. \( 4x - 3y = 6 \) \( 8x = 6y + 10 \)  
\[ \begin{align*} x &= 0.5 \\ y &= -1 \end{align*} \]

67. \( 3x + 7y = 8 \) \( 21y = -9x + 24 \)  
\[ \begin{align*} x &= 2 \\ y &= 0 \end{align*} \]

68. Graph the system of linear inequalities.
\[ y > \frac{4}{7}x - 2 \]
\[ y < 3x + 4 \]
1. 19  2. 82  3. 28  4. 22  5. 42  6. 77
7. $5x + 17$  8. $21 - 5y < 7$  9. $\frac{75}{z + 2} = 25$
10. solution  11. not a solution
12. $21x + 15c; $129  13. 38.32 km  14. 5.8 ft
15. 11  16. 14  17. 7
18. $-\sqrt{5}$, -1.6, 0, $\sqrt{4}$, 3.1  19. -48
25. $l = \frac{P - 2w}{2}$  26. 11 in.  27. 3  28. 7  29. 3
30. length: 21 ft, width: 14 ft  31. $y = 4x + 5$
32. $y = -\frac{1}{2}x + 3$  33. $\frac{1}{2}$  34. -5
35. $m = \frac{4}{5}$, $b = 9$  36. $m = \frac{4}{7}$, $b = -3$
37. yes; 10  38. no
39.  40.
41. $p = 2.4a; $72
42. 
Because the graph of $h(x)$ and $f(x)$ have the same slope, $m = 1$, the lines are parallel. Also, the $y$-intercept of the graph of $h$ is 4 less than the $y$-intercept of the graph of $f$.
43. $y = 3x + 5$  44. $y = -2x + 3$
45. $y = \frac{5}{4}x - \frac{7}{4}$  46. $y = \frac{1}{3}x + \frac{4}{3}$
47. $y = -\frac{3}{2}x + 1$  48. $y = 4x + 10$
49. $y = -x + 2$  50. $y = \frac{3}{5}x + \frac{6}{5}$
51. $3x - 2y = 5$

Sample answer: $y = 3x - 2$
53. $x \geq 4.3$
54. $x > 21$
55. $x \leq 3$
56. $-2 < x < 1$
57. $x < -4.5$ or $x > 0.5$
58. $x > 10$ or $x < -12$
59. -3, 7  60. no solution
61. $p + g \leq 500$
62. (-3, -2)  63. (2, 3)  64. (-1, 8)
65. (4, 1)  66. no solution  67. infinitely many solutions
68. 
Answers will vary.