Cumulative Test 1

Evaluate the expression.

1. $7 + 6^2 \div 3$

$7 + 36 \div 3$

$7 + 12$

$\boxed{19}$

2. $4 \cdot 5^2 - 18$

$4 \cdot 25 - 18$

$100 - 18$

$\boxed{82}$

5. $3(5m - 4)$ when $m = -2$

$3(5(-2) - 4)$

$3(-10 - 4)$

$3(-14)$ $\boxed{-42}$

6. $9x^2 - 4$ when $x = 3$

$9(3)^2 - 4$

$9 \cdot 9 - 4$

$81 - 4$ $\boxed{77}$

Write an algebraic expression, an equation, or an inequality.

7. The sum of 5 times a number x and 17

$\boxed{5x + 17}$

8. The difference of 21 and the product of 5 and a number y is less than 7.

$21 - 5y < 7$

9. The quotient of 75 and the quantity of a number z and 2 is 25.

$\dfrac{75}{2z} = 25$

} Answers will vary

Check whether the given number is a solution of the equation or inequality.

10. $5c - 13 = 12; 2$

$5(2) - 13 = 12$

$10 - 13 = 12$

$-3 \neq 12$ $\boxed{\text{Not a Solution}}$

11. $21 - 2d < 7; 6$

$21 - 2(6) < 7$

$21 - 12 < 7$

$9 \not< 7$ $\boxed{\text{Not a solution}}$

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.

$21a + 15c = t$

$21(4) + 15(3) = t$

$\boxed{\$369}$

Solve the equation.

19. $\dfrac{-6 \cdot m}{-6} = 8 \cdot -6$

$\boxed{M = -48}$

20. $17 = 4x - 7$

$ +7 \qquad +7$

$\dfrac{24}{4} = \dfrac{4x}{4}$

$\boxed{x = 6}$

21. $9 - \dfrac{n}{3} = 28$

$ -9 \phantom{-\frac{n}{3}} -9$

$-3 \cdot -\dfrac{n}{3} = 19 \cdot -3$

$\boxed{n = -57}$

22. $16w - 10w + 13 = -5$

$6w + 13 = -5$
$\quad -13 \quad -13$
$\dfrac{6w}{6} = \dfrac{-18}{6}$
$\boxed{w = -3}$

23. $4h - 13 = 7h + 2$
$-4h - 2 \quad -4h - 2$
$\dfrac{-15}{3} = \dfrac{3h}{3}$
$\boxed{h = -5}$

24. $\dfrac{2}{5}(25z - 30) = \dfrac{3}{4}(12z + 16)$

$10z - 12 = 9z + 12$
$-9z + 12 \quad -9z + 12$
$\boxed{z = 24}$

The perimeter P of a rectangle is given by the formula $P = 2\ell + 2w$ where ℓ is the length and w is the width.

25. Solve the formula for ℓ.

$P = 2\ell + 2w$
$\qquad -2w \; -2w$
$-2w$
$\dfrac{P - 2w}{2} = \dfrac{2\ell}{2}$
$\boxed{\ell = \dfrac{P}{2} - w}$

26. Use the rewritten formula to find the length of a rectangle with a width of 9 inches and a perimeter of 40 inches.

$\ell = \dfrac{40}{2} - 9$
$\ell = 20 - 9$
$\boxed{\ell = 11}$

Solve the proportion.

27. $\dfrac{x}{8} = \dfrac{12}{32}$

$\dfrac{32x}{32} = \dfrac{96}{32}$
$\boxed{x = 3}$

28. $\dfrac{12}{3w} = \dfrac{36}{63}$

$\dfrac{756}{108} = \dfrac{108w}{108}$
$\boxed{w = 7}$

29. $\dfrac{21}{15} = \dfrac{3k - 2}{5}$

$105 = 15(3k - 2)$
$105 = 15k - 30$
$+30 \qquad\quad +30$
$\dfrac{135}{15} = \dfrac{15k}{15}$
$\boxed{k = 9}$

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

31. $-12x + 3y = 15$
$+12x \qquad\quad +12x$
$\dfrac{3y}{3} = \dfrac{12x + 15}{3}$
$\boxed{y = 4x + 5}$

32. $5x = -10y + 30$
$\quad -30 \qquad\quad -30$
$\dfrac{5x - 30}{-10} = \dfrac{-10y}{-10}$
$-\tfrac{1}{2}x + 3 = y \quad \boxed{y = -\tfrac{1}{2}x + 3}$

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

33. $(-7, 3)$ and $(3, 8)$
$\quad x_1 \; y_1 \qquad x_2 \; y_2$
$\dfrac{y_2 - y_1}{x_2 - x_1}$
$\dfrac{8 - 3}{3 - -7} = \dfrac{5}{10} = \boxed{\dfrac{1}{2}}$

34. $(-2, -9)$ and $(-5, 6)$
$\quad x_1 \; y_1 \qquad x_2 \; y_2$
$\dfrac{6 + 9}{-5 + 2} = \dfrac{15}{-3} = \boxed{-5}$

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

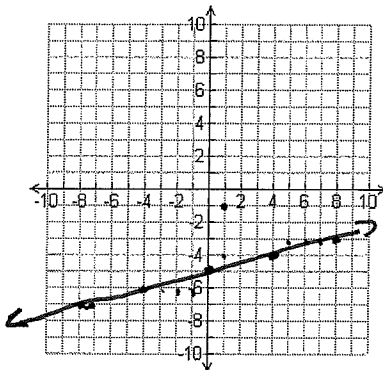**35.** $y = -\dfrac{4}{5}x + 9$

$m = \dfrac{-4}{5}$

y-int: 9

36. $4x - 7y = 21$

$-4x \qquad -4x$

$\dfrac{-7y}{-7} = \dfrac{-4x + 21}{-7}$

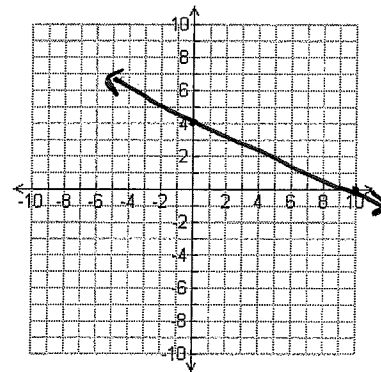$y = \dfrac{4}{7}x - 3$

$m = \dfrac{4}{7}$

y-int: -3

Graph the equation.

39. $y = \dfrac{1}{4}x - 5$

40. $2x + 5y = 20$

$y = 4$

$x = 10$

Write an equation of the line with the given characteristics.

44. $m = -2$; passes through $(-1, 5)$ (Slope intercept)

$y = mx + b$

$5 = -2(-1) + b$

$5 = 2 + b$

$-2 \quad -2$

$3 = b$

$y = -2x + 3$

45. passes through $(3, 2)$ and $(-5, -8)$ (point slope)

$x_1 y_1 \qquad x_2 y_2$

$\dfrac{-8 - 2}{-5 - 3} = \dfrac{-10}{-8} = \dfrac{5}{4}$

$(y - 2) = \dfrac{5}{4}(x - 3)$

46. perpendicular to $y = -2x + 1$; passes through $(2, 10)$

$y = mx + b \qquad -2 \dfrac{1}{} \rightarrow \dfrac{1}{2}$

$10 = \dfrac{1}{2}(2) + b$

$10 = 1 + b$

$-1 \quad -1$

$9 = b$

$y = \dfrac{1}{2}x + 9$

50. parallel to $y = \dfrac{3}{5}x - \dfrac{1}{5}$; and passes through $(-5, 7)$

$y = mx + b$

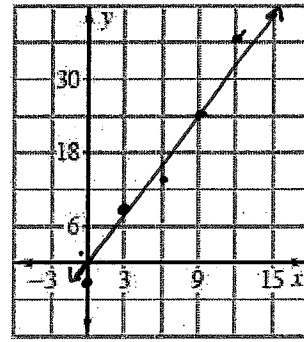$7 = \dfrac{3}{5}(-5) + b$

$7 = -3 + b$

$+3 \quad +3$

$b = 10$

$y = \dfrac{3}{5}x + 10$

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.
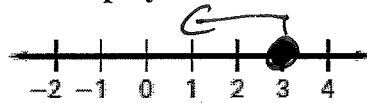
x	0	3	6	9	12
y	−2	8	14	24	36

approximately $\left(y = \frac{1}{2}x\right)$

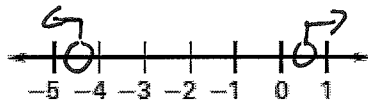**Solve the inequality, if possible. Graph your solution.**
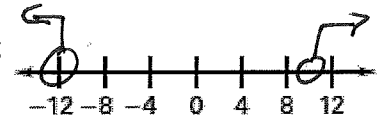
55. $5 + 2x \le -4x + 23$

$-5 + 4x \quad +4x - 5$

$\dfrac{6x \le 18}{6} \quad \dfrac{}{6}$

$\boxed{x \le 3}$

57. $-2x \ge 9$ or $4x + 7 > 9$

$\dfrac{-2}{-2} \quad \dfrac{}{-2}$

$-7 \quad -7$

$\dfrac{4x > 2}{4} \quad \dfrac{}{4}$

$\boxed{x < -\frac{9}{2}}$

$x > \frac{1}{2}$

58. $|x+1| - 3 > 8$

$+3 + 3$

$|x+1| > 11$

$\begin{array}{ll} x+1 > 11 & x+1 < -11 \\ -1 \quad -1 & -1 \quad -1 \\ \boxed{x > 10} & \boxed{x < -12} \end{array}$

Solve the equation, if possible.

59. $\dfrac{3|x-2|}{3} = \dfrac{15}{3}$

$|x-2| = 5$

$\begin{array}{ll} x - 2 = 5 & x - 2 = -5 \\ +2 \quad +2 & +2 \quad +2 \\ \boxed{x = 7} & x = -3 \end{array}$

60. $|x+2| + 6 = 4$

$-6 \quad -6$

$|x+2| = -2$

Not possible

61. Graph $y > -2x + 6$

$0 > 0 + 6$
$0 > 6$ False

62. Graph $y = |x-2|$