2-4 Writing Linear Equations

Write an equation in slope-intercept form for the line described.

1. slope 1.5, passes through (0, 5)

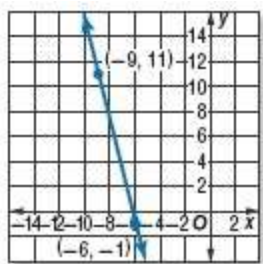   *ANSWER:*

   $y = 1.5x + 5$

3. passes through (3, 5); $m = -2$

   ANSWER:

   $y = -2x + 11$

5. **MULTIPLE CHOICE** Which is an equation of the line?

   A $y = -4x - 25$

   B $y = -\dfrac{2}{3}x - 5$

   C $y = \dfrac{4}{5}x + \dfrac{29}{25}$

   D $y = 6x + 35$

   ANSWER:

   A

CCSS PERSEVERANCE **Write an equation in slope-intercept form for the line that satisfies each set of conditions.**

7. passes through (4, −10), parallel to $y = \dfrac{7}{8}x - 3$

   ANSWER:

   $y = \dfrac{7}{8}x - \dfrac{27}{2}$

Write an equation in slope-intercept form for the line described.

9. slope $-\dfrac{1}{2}$, passes through (0, 5)

   ANSWER:

   $y = -\dfrac{1}{2}x + 5$

11. slope $\dfrac{9}{2}$, passes through $\left(0, -\dfrac{13}{2}\right)$

   ANSWER:

   $y = 4.5x - 6.5$

13. slope 4, passes through (6, 9)

   ANSWER:

   $y = 4x - 15$

15. slope $-\dfrac{1}{4}$, passes through (12, −4)

   ANSWER:

   $y = -\dfrac{1}{4}x - 1$

Write an equation of the line passing through each pair of points.

17. (−2, −6), (4, 6)

   ANSWER:

   $y = 2x - 2$

19. (–4, 12), (–2, –4)

    ANSWER:

    $y = -8x - 20$

21. (5.5, 0.6), (1.1, 2.8)

    ANSWER:

    $y = -0.5x + 3.35$

    CCSS PERSEVERANCE Write an equation in slope-intercept form for the line that satisfies each set of conditions.

23. passes through (4, 2), perpendicular to $y = -2x + 3$

    ANSWER:

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

25. passes through (12, 0), parallel to $y = -\dfrac{1}{2}x - 3$

    ANSWER:

    $y = -\dfrac{1}{2}x + 6$

27. **FINANCIAL LITERACY** Julio buys a used car for $5900. Monthly expenses for the car—which include insurance, maintenance, and gas—total $180 per month. Write an equation that represents the total cost of buying and owning the car for x months.
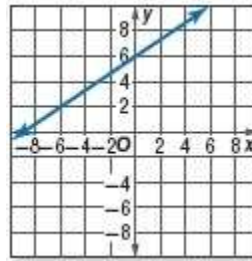
    ANSWER:

    $y = 180x + 5900$

29. **WHALES** In 2009, it was estimated that there were 300 northern right whales in existence. The population of northern right whales is expected to decline by at least 25 whales each generation. Write an equation that represents the number of right whales that will be in existence in x generations.

    ANSWER:

    $y = -25x + 300$

Write an equation in slope-intercept form for each graph.

31.

    ANSWER:

    $y = \dfrac{2}{3}x + 6$

33. **ROSES** Brad wants to send his girlfriend Kelli a dozen roses. He visits two stores. For what distance do the two stores charge the same amount to deliver a dozen roses?

Full Bloom	Flowers R US
Dozen roses $30	Dozen roses $40
Delivery: $3 per mile	Delivery: $2 per mile

    ANSWER:

    10 mi

35. **RECRUITING** As an army recruiter, Ms. Cooper is paid a daily salary plus commission. When she recruits 10 people, she earns $100. When she recruits 14 people, she earns $120.

    a. Write a linear equation to model this situation.

    b. What is Ms. Cooper's daily salary?

    c. How much would Ms. Cooper earn in a day if she recruits 20 people?

    ANSWER:

    a. $y = 5x + 50$
    b. $50
    c. $150

37. **REASONING** Determine whether the following statement is always, sometimes, or never true. Explain your reasoning.

    The quadrilateral formed by any two parallel lines and two lines perpendicular to those lines is a square.

    ANSWER:

    Sample answer: Sometimes; while the two sets of parallel and perpendicular lines will always form a quadrilateral with four 90° angles, that figure will always be a rectangle, but not necessarily a square.

39. **REASONING** Write $y = ax + b$ in point-slope form.

    ANSWER:

    Sample answer: $y - 0 = a\left(x + \dfrac{b}{a}\right)$

41. **REASONING** Write an equation in point-slope form of a line with an x-intercept of c and y-intercept of d.

    ANSWER:

    Sample answer: $y - d = -\dfrac{d}{c}(x - 0)$

43. The total cost c in dollars to go to a water park and ride n water rides is given by the equation $c = 15 + 3n$.

    If the total cost was $33, how many water rides were ridden?

    A 6

    B 7

    C 8

    D 9

    ANSWER:

    A

45. **PROBABILITY** A fair six-sided die is tossed. What is the probability that a number less than 3 will show on the face of the die?

    F $\dfrac{1}{6}$

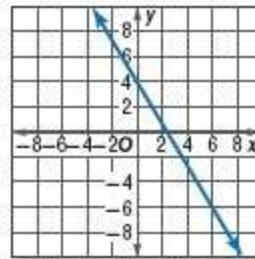   **G** $\dfrac{1}{3}$

    H $\dfrac{1}{2}$

    J $\dfrac{2}{3}$

    ANSWER:

    G

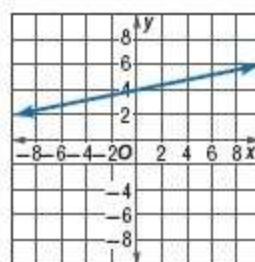**Determine the rate of change of each graph.**

47.

ANSWER:

$-\dfrac{5}{3}$

49.

ANSWER:

$\dfrac{1}{5}$

2-4 Writing Linear Equations

Solve each inequality.

51. $-6x - 4 \leq 12 - 2x$

    ANSWER:

    $x \geq -4$

53. $\dfrac{5x + 3}{3} \geq \dfrac{4x - 2}{5}$

    ANSWER:

    $x \geq -\dfrac{21}{13}$

Determine if the triangles with the following lengths are right triangles.

55. 36, 48, 60

    ANSWER:

    yes

Multiply.

57. $(4c - 6)(2c + 5)$

    ANSWER:

    $8c^2 + 8c - 30$

59. $(2a - 5)(-3a - 4)$

    ANSWER:

    $-6a^2 + 7a + 20$

Find the slope of the line that passes through each pair of points. Express as a fraction in simplest form.

61. $(-6, 3), (-2, 9)$

    ANSWER:

    $\dfrac{3}{2}$

63. $(12, 4), (42, 10)$

    ANSWER:

    $\dfrac{1}{5}$

65. $(3.5, -2.5), (-1, -2)$

    ANSWER:

    $-\dfrac{1}{9}$