CHAPTER 2

Algebra Review

EXAMPLE 1 Determining Whether a Point is on a Line

Decide whether $(3, -2)$ is a solution of the equation $y = 2x - 8$.

$-2 = 2(3) - 8$ **Substitute 3 for x and -2 for y.**

$-2 = -2$ **Simplify.**

The statement is true, so $(3, -2)$ is a solution of the equation $y = 2x - 8$.

STUDENT HELP

Look Back
For help with the properties of equality, see p. 96.

EXERCISES

Decide whether the given ordered pair is a solution of the equation.

1. $y = 6x + 4; (-2, 8)$

2. $y = -10x - 2; (1, -12)$

3. $y = -\frac{1}{4}x - 18; (-4, -17)$

4. $y = \frac{3}{2}x + 10; (4, 12)$

5. $y = \frac{5}{9}x + 34; (-9, 27)$

6. $y = \frac{2}{3}x - 6; (9, 0)$

7. $y = \frac{4}{5}x - 2; (10, -3)$

8. $y = \frac{1}{2}x + 7; (4, 7)$

9. $2x - 3y = 10; (3, 4)$

10. $9x - y = -4; (-1, -5)$

11. $y - 6 = \frac{3}{4}x; (8, 12)$

12. $y + 5 = \frac{5}{3}x; (9, 10)$

EXAMPLE 2 Calculating Slope

Find the slope of a line passing through $(3, -9)$ and $(2, -1)$.

$m = \frac{y_2 - y_1}{x_2 - x_1}$ **Formula for slope**

$m = \frac{-1 - (-9)}{2 - 3} = \frac{-1 + 9}{-1}$ **Substitute values and simplify.**

$m = \frac{8}{-1} = -8$ **Slope is -8.**

EXERCISES

Find the slope of the line that contains the points.

13. $(4, 1), (3, 6)$

14. $(-8, 0), (5, -2)$

15. $(5, 6), (9, 8)$

16. $(0, -4), (7, -3)$

17. $(-1, 7), (-3, 18)$

18. $(-6, -4), (1, 10)$

19. $(4, -10), (-2, 2)$

20. $(11, 1), (-11, 1)$

21. $(14, -5), (5, 8)$

22. $(-7, 5), (-1, -1)$

23. $(-12, 8), (-3, -6)$

24. $(-9, 13), (2, -10)$

25. $(12, 3), (0, -4)$

26. $(9, -8), (-7, 10)$

27. $(2, -5), (6, -6)$

EXAMPLE 3 Finding the Equation of a Line

Find an equation of the line that passes through the point (3, 4) and has a y-intercept of 5.

$y = mx + b$ **Write the slope-intercept form.**

$4 = 3m + 5$ **Substitute 5 for *b*, 3 for *x*, and 4 for *y*.**

$-1 = 3m$ **Subtract 5 from each side.**

$-\frac{1}{3} = m$ **Divide each side by 3.**

The slope is $m = -\frac{1}{3}$. The equation of the line is $y = -\frac{1}{3}x + 5$.

EXERCISES

Write the equation of the line that passes through the given point and has the given *y*-intercept.

28. $(2, 1)$; $b = 5$ **29.** $(-5, 3)$; $b = -12$ **30.** $(-3, 10)$; $b = 8$

31. $(7, 0)$; $b = 13$ **32.** $(-3, -3)$; $b = -2$ **33.** $(-1, 4)$; $b = -8$

34. $(-11, 8)$; $b = -14$ **35.** $(4, -6)$; $b = -2$ **36.** $(5, -8)$; $b = 7$

37. $(-2, -1)$; $b = -5$ **38.** $(2, 3)$; $b = 2$ **39.** $(3, 0.5)$; $b = 1.5$

EXAMPLE 4 Finding the Equation of a Line

Write an equation of the line that passes through the points (4, 8) and (3, 1).

Find the slope of the line.

$m = \frac{1 - 8}{3 - 4}$ **Substitute values.**

$m = \frac{-7}{-1} = 7$ **Simplify.**

$1 = 7(3) + b$ **Substitute values into *y* = *mx* + *b*.**

$1 = 21 + b$ **Multiply.**

$-20 = b$ **Solve for *b*.**

The equation of the line is $y = 7x - 20$.

EXERCISES

Write an equation of the line that passes through the given points.

40. $(6, -3)$, $(1, 2)$ **41.** $(-7, 9)$, $(-5, 3)$ **42.** $(5, -1)$, $(4, -5)$

43. $(-2, 4)$, $(3, -6)$ **44.** $(-3, -7)$, $(0, 8)$ **45.** $(1, 2)$, $(-1, -4)$

46. $(6, -2)$, $(0, 4)$ **47.** $(-4, 3)$, $(-3, -3)$ **48.** $(-3, 2)$, $(-5, -2)$

49. $(10, -9)$, $(14, -1)$ **50.** $(-1, -2)$, $(5, 0)$ **51.** $(-6, 4)$, $(6, -1)$