5-6 Practice

Form K

Parallel and Perpendicular Lines

Write an equation in slope-intercept form of the line that passes through the given point and is parallel to the graph of the given equation.

1. $(-1, 3); y = 2x - 8$ **y = 2x + 5**

2. $(2, 6); y = -3x + 5$ **y = −3x + 12**

3. $(-3, 12); y = -\frac{1}{3}x + 7$ **y = −$\frac{1}{3}$x + 11**

4. $(8, -10); y = \frac{3}{4}x + 1$ **y = $\frac{3}{4}$x − 16**

Determine whether the graphs of the given equations are *parallel*, *perpendicular*, or neither. Explain.

5. $y = -5x + 9$ **parallel**
   $5x + y = -21$

6. $x = \frac{1}{10}$ **perpendicular**
   $y = \frac{1}{10}$

7. $y = -4x + 14$ **perpendicular**
   $-x + 4y = 14$

8. $y = \frac{6}{7}x + 4$ **neither**
   $y = -\frac{6}{7}x - 5$

Determine whether each statement is *always*, *sometimes*, or *never* true. Explain.

9. Two lines with different slopes are parallel. **never**

10. Two lines with the same *y*-intercept are perpendicular. **sometimes**

11. Two lines whose slopes are opposites of each other are perpendicular. **sometimes**

5-6

Practice (continued)

Form K

Parallel and Perpendicular Lines

Write an equation of the line that passes through the given point and is perpendicular to the graph of the given equation.

12. $(6, -2); y = -3x + 4$ $y = \frac{1}{3}x - 4$

13. $(2, 7); y = \frac{1}{2}x - 11$ $y = -2x + 11$

14. $(-5, -6); x + y = 6$ $y = x - 1$

15. $(4, -5); 2x + 2y = 6$ $y = x - 9$

16. Open-Ended Write the equations of three lines whose graphs are parallel to $y = 2x + 11$.
Answers may vary. Sample: $y = 2x + 4$, $y = 2x + 1$, $y = 2x - 3$

17. Open-Ended Write the equations of two lines whose graphs are perpendicular to $y = -\frac{1}{3}x - 9$.
Answers may vary. Sample: $y = 3x - 4$, $y = 3x + 1$

18. What is the slope of a line that is parallel to $y = 2$? **0**

19. What is the slope of a line that is perpendicular to $y = 2$? **undefined**

20. What is the slope of a line that is parallel to $x = -4$? **undefined**

21. What is the slope of a line that is perpendicular to $x = -4$? **0**

22. On a map, Center St. passes through coordinates $(5, -3)$ and $(3, 7)$. Merrie Rd. intersects Center St. and passes through coordinates $(2, 6)$ and $(-3, 5)$. Are these streets perpendicular? Explain.
yes; the slopes are -5 and $\frac{1}{5}$