Unit 2.5 Practice Slopes of Parallel and Perpendicular Lines

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

1. $(3, 2);$ $\quad y = 3x - 2$

2. $(-4, -1);$ $\quad y = 2x + 14$

3. $(-8, 6);$ $\quad y = -\frac{1}{4}x + 5$

4. $(6, 2);$ $\quad y = \frac{2}{3}x + 19$

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

6. $(-3, 4);$ $\quad y = 2$

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

7. $y = 4x + 5$
    $-4x + y = -13$

8. $y = \frac{7}{9}x - 7$
    $y = -\frac{7}{9}x + 3$

9. $y = \frac{7}{8}$
    $x = -4$

10. $y = -6x - 8$
    $-x + 6y = 12$

11. $3x + 6y = 12$
    $y - 4 = -\frac{1}{2}(x + 2)$

12. $y = 4x + 12$
    $x + 4y = 32$

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

13. Two lines with different slopes are perpendicular.

14. The slopes of vertical lines and horizontal lines are opposite reciprocals.

15. A vertical line is perpendicular to the x-axis.

Write an equation of the line that passes through the given point and is perpendicular to the graph of the given equation. Give your answer in slope intercept form.

16. $(2, -1)$; $y = -2x + 1$

17. $(5, 7)$; $y = \frac{1}{3}x + 2$

18. $(3, -6)$; $x + y = -4$

19. $(-9, 3)$; $3x + y = 5$

20. $(-8, 3)$; $y + 4 = -\frac{2}{3}(x - 2)$

21. $(0, -5)$; $x - 6y = -2$

22. Write the equation of three lines whose graphs are parallel to one another.

23. Write the equation of two lines whose graphs are perpendicular to one another.

24. What is the slope of a line that is parallel to the x-axis?

25. What is the slope of a line that is perpendicular to the x-axis?

26. What is the slope of a line that is parallel to the y-axis?

27. What is the slope of a line that is perpendicular to the y-axis?

28.   On a map, Sandusky St. passes through coordinates $(2, -1)$ and $(4, 8)$.
       Pennsylvania Ave. intersects Sandusky St. and passes through coordinates $(1, 3)$ and $(6, 2)$.
       Are these streets perpendicular? Explain why or why not.

29. Explain how you can determine if the graphs of two lines are parallel or perpendicular without graphing the lines.