Find the slope of a line parallel to the graph of each equation.

1. 7x - y = 5 2. y = 5

Are the graphs of the lines in each pair parallel?

- 3. $y = \frac{1}{3}x + 3$ x - 3y = 64. y = 4x + 12-4x + 3y = 21
- 5. Write an equation for the line that is parallel to $y = -\frac{2}{3}x + 12$ and passes through (5, -3).

Find the slope of a line perpendicular to the graph of each equation.

6. $y = -\frac{x}{5} - 7$ 7. y = -8

8. Write an equation for the line that is perpendicular to -10x + 8y = 3 and passes through (15,12).

9. A city's civil engineer is planning a new parking garage and a new street. The new street will go from the entrance of the parking garage to Handel St. It will be perpendicular to Handel St. What is the equation of the line representing the new street?



Tell whether the lines for each pair of equations are <u>parallel</u>, <u>perpendicular</u>, or <u>neither</u>.

10.

$$y = 4x + \frac{5}{4}$$

$$y = -\frac{1}{4}x + 4$$
11.

$$3x - 5y = 3$$

$$-5x + 3y = 8$$
12.

$$y = \frac{x}{3} - 4$$

$$y = \frac{1}{3}x + 2$$

13.
$$ax - by = 5$$

 $-ax + by = 2$
14. $ax + by = 8$
 $bx - ay = 1$

15. For what value of k are the graphs of 3x + 12y = 8 and 6y = kx - 5 parallel?

16. For what value of k are the graphs of 3x + 12y = 8 and 6y = kx - 5 perpendicular?

 17. A parallelogram has vertices A(0,2), B(2,-1), C(6,3), and D(p,q). Which of the following ordered pairs has possible values for (p,q)?

 (a) (0,6)
 (b) (6,1)
 (c) (4,6)
 (d) (6,4)

18. Suppose the line through points (x,6) and (1,2) is parallel to the graph of 2x + y = 3. Find the value of x. Show your work