

Practice

Parallel and Perpendicular Lines

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

1. $y = 3x + 4$
 $y = 3x + 7$

parallel

2. $y = -4x + 1$
 $4y = x + 3$

$$y = \frac{1}{4}x + \frac{3}{4}$$

perp

3. $y = 2x - 5$
 $y = 5x - 5$

neither

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

$$y = 3x - 5$$

perp

5. $y = \frac{3}{5}x - 3$

$$5y = 3x - 10$$

parallel

6. $y = 4$
 $4y = 6$

parallel

7. $y = 7x + 2$

$$x + 7y = 8$$

$$7y = -x + 8$$

$$y = -\frac{1}{7}x + \frac{8}{7}$$

perp

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

$$x + 5y = 4$$

neither

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

$$y = \frac{8}{3}x + 3$$

perp

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

10. $y = 3x + 6$; (4, 7)

$$y - 7 = 3(x - 4)$$

$$y - 7 = 3x - 12$$

$$y = 3x - 5$$

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

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

$$y - 1 = -\frac{2}{3}x - 4$$

$$y = -\frac{2}{3}x - 3$$

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

$$y - 3 = 1(x + 2)$$

$$y - 3 = x + 2$$

$$y = x + 5$$

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

$$y - 3 = \frac{2}{5}(x - 5)$$

$$y - 3 = \frac{2}{5}x - 2$$

$$y = \frac{2}{5}x + 1$$

12. $y = \frac{1}{2}x + 5$; (4, -5)

$$y + 5 = \frac{1}{2}(x - 4)$$

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

$$y = \frac{1}{2}x - 7$$

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

$$y - 2 = -2(x + 1)$$

$$y - 2 = -2x - 2$$

$$y = -2x$$

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

16. $y = -5x + 1$; (2, -1)

$$y + 1 = \frac{1}{5}(x - 2)$$

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

$$y = \frac{1}{5}x - \frac{7}{5}$$

17. $y = 2x - 3$; (-5, 3)

$$y - 3 = -\frac{1}{2}(x + 5)$$

$$y - 3 = -\frac{1}{2}x - \frac{5}{2}$$

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

18. $4x + 7y = 3$; (-4, -7)

$$y + 7 = \frac{4}{7}(x + 4)$$

$$y + 7 = \frac{4}{7}x + \frac{4}{7}$$

$$y = \frac{4}{7}x - \frac{46}{7}$$

19. $3x - 4y = 2$; (6, 0)

$$-4y = -3x + 2$$

$$y = \frac{3}{4}x - \frac{1}{2}$$

$$y = -\frac{4}{3}(x - 6)$$

$$y = -\frac{4}{3}x + 8$$

20. $y = -4x - 2$; (4, -4)

$$y + 4 = \frac{1}{4}(x - 4)$$

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

$$y = \frac{1}{4}x - 5$$

21. $6x + 5y = -3$; (-6, 2)

$$5y = -6x - 3$$

$$y = -\frac{6}{5}x - \frac{3}{5}$$

$$y - 2 = \frac{5}{6}(x + 6)$$

$$y - 2 = \frac{5}{6}x + 5$$

$$y = \frac{5}{6}x + 7$$