

G.G.64: Parallel and Perpendicular Lines: Find the equation of a line, given a point on the line and the equation of a line perpendicular to the given line

- 1 What is an equation of the line that passes through the point $(-2, 5)$ and is perpendicular to the line whose equation is $y = \frac{1}{2}x + 5$?
 - 1) $y = 2x + 1$
 - 2) $y = -2x + 1$
 - 3) $y = 2x + 9$
 - 4) $y = -2x - 9$
- 2 What is an equation of the line that is perpendicular to the line whose equation is $y = \frac{3}{5}x - 2$ and that passes through the point $(3, -6)$?
 - 1) $y = \frac{5}{3}x - 11$
 - 2) $y = -\frac{5}{3}x + 11$
 - 3) $y = -\frac{5}{3}x - 1$
 - 4) $y = \frac{5}{3}x + 1$
- 3 What is the equation of the line that passes through the point $(-9, 6)$ and is perpendicular to the line $y = 3x - 5$?
 - 1) $y = 3x + 21$
 - 2) $y = -\frac{1}{3}x - 3$
 - 3) $y = 3x + 33$
 - 4) $y = -\frac{1}{3}x + 3$
- 4 What is an equation of the line that contains the point $(3, -1)$ and is perpendicular to the line whose equation is $y = -3x + 2$?
 - 1) $y = -3x + 8$
 - 2) $y = -3x$
 - 3) $y = \frac{1}{3}x$
 - 4) $y = \frac{1}{3}x - 2$
- 5 The equation of a line is $y = \frac{2}{3}x + 5$. What is an equation of the line that is perpendicular to the given line and that passes through the point $(4, 2)$?
 - 1) $y = \frac{2}{3}x - \frac{2}{3}$
 - 2) $y = \frac{3}{2}x - 4$
 - 3) $y = -\frac{3}{2}x + 7$
 - 4) $y = -\frac{3}{2}x + 8$
- 6 What is an equation of the line that passes through $(-9, 12)$ and is perpendicular to the line whose equation is $y = \frac{1}{3}x + 6$?
 - 1) $y = \frac{1}{3}x + 15$
 - 2) $y = -3x - 15$
 - 3) $y = \frac{1}{3}x - 13$
 - 4) $y = -3x + 27$

- 7 Which equation represents the line that is perpendicular to $2y = x + 2$ and passes through the point $(4,3)$?

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

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

3) $y = -2x + 11$

4) $y = -2x - 5$

- 8 What is an equation of the line that passes through the point $(2,4)$ and is perpendicular to the line whose equation is $3y = 6x + 3$?

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

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

3) $y = 2x - 6$

4) $y = 2x$

- 9 Write an equation of the line that is perpendicular to the line whose equation is $2y = 3x + 12$ and that passes through the origin.

- 10 Find an equation of the line passing through the point $(6,5)$ and perpendicular to the line whose equation is $2y + 3x = 6$.

- 11 Write an equation of a line that is perpendicular to the line $y = \frac{2}{3}x + 5$ and that passes through the point $(0,4)$.

G.G.64: Parallel and Perpendicular Lines: Find the equation of a line, given a point on the line and the equation of a line perpendicular to the given line

Answer Section

1 ANS: 2 REF: 060907ge

2 ANS: 3 REF: 011217ge

3 ANS: 4

$$m_{\perp} = -\frac{1}{3} \cdot y = mx + b$$

$$6 = -\frac{1}{3}(-9) + b$$

$$6 = 3 + b$$

$$3 = b$$

REF: 061215ge

4 ANS: 4 REF: 011018ge

5 ANS: 4

$$m = \frac{2}{3} \cdot 2 = -\frac{3}{2}(4) + b$$

$$m_{\perp} = -\frac{3}{2} \quad 2 = -6 + b$$

$$8 = b$$

REF: 011319ge

6 ANS: 2

$$m = \frac{1}{3} \quad 12 = -3(-9) + b$$

$$m_{\perp} = -3 \quad 12 = 27 + b$$

$$-15 = b$$

REF: 081404ge

7 ANS: 3

The slope of $2y = x + 2$ is $\frac{1}{2}$, which is the opposite reciprocal of -2 . $3 = -2(4) + b$

$$11 = b$$

REF: 081228ge

8 ANS: 1

$$m = \frac{6}{3} = 2 \quad m_{\perp} = -\frac{1}{2} \quad 4 = -\frac{1}{2}(2) + b$$

$$4 = -1 + b$$

$$5 = b$$

REF: 061507ge

9 ANS:

$$m = \frac{3}{2}; m_{\perp} = -\frac{2}{3} \quad y = -\frac{2}{3}x$$

REF: 081533ge

10 ANS:

$$y = \frac{2}{3}x + 1. \quad 2y + 3x = 6 \quad . \quad y = mx + b$$

$$2y = -3x + 6 \quad 5 = \frac{2}{3}(6) + b$$

$$y = -\frac{3}{2}x + 3 \quad 5 = 4 + b$$

$$m = -\frac{3}{2} \quad 1 = b$$

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

REF: 061036ge

11 ANS:

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

REF: 010834a