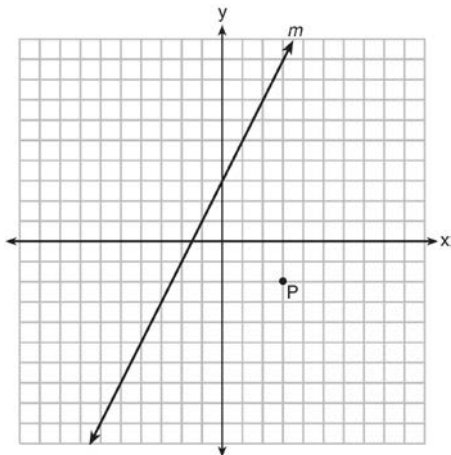


G.G.65: Parallel and Perpendicular Lines 1: Find the equation of a line, given a point on the line and the equation of a line parallel to the desired line

- 1 Line m and point P are shown in the graph below.



Which equation represents the line passing through P and parallel to line m ?

- 1) $y - 3 = 2(x + 2)$
 - 2) $y + 2 = 2(x - 3)$
 - 3) $y - 3 = -\frac{1}{2}(x + 2)$
 - 4) $y + 2 = -\frac{1}{2}(x - 3)$
- 2 What is the equation of a line passing through $(2, -1)$ and parallel to the line represented by the equation $y = 2x + 1$?
- 1) $y = -\frac{1}{2}x$
 - 2) $y = -\frac{1}{2}x + 1$
 - 3) $y = 2x - 5$
 - 4) $y = 2x - 1$
- 3 What is an equation of the line that passes through the point $(-2, 3)$ and is parallel to the line whose equation is $y = \frac{3}{2}x - 4$?
- 1) $y = \frac{-2}{3}x$
 - 2) $y = \frac{-2}{3}x + \frac{5}{3}$
 - 3) $y = \frac{3}{2}x$
 - 4) $y = \frac{3}{2}x + 6$
- 4 Which equation represents a line that is parallel to the line whose equation is $y = \frac{3}{2}x - 3$ and passes through the point $(1, 2)$?
- 1) $y = \frac{3}{2}x + \frac{1}{2}$
 - 2) $y = \frac{2}{3}x + \frac{4}{3}$
 - 3) $y = \frac{3}{2}x - 2$
 - 4) $y = -\frac{2}{3}x + \frac{8}{3}$
- 5 What is an equation of the line that passes through the point $(4, 5)$ and is parallel to the line whose equation is $y = \frac{2}{3}x - 4$?
- 1) $2y + 3x = 11$
 - 2) $2y + 3x = 22$
 - 3) $3y - 2x = 2$
 - 4) $3y - 2x = 7$
- 6 What is an equation of the line that passes through the point $(-2, 1)$ and is parallel to the line whose equation is $4x - 2y = 8$?
- 1) $y = \frac{1}{2}x + 2$
 - 2) $y = \frac{1}{2}x - 2$
 - 3) $y = 2x + 5$
 - 4) $y = 2x - 5$

- 7 Line ℓ passes through the point $(5,3)$ and is parallel to line k whose equation is $5x + y = 6$. An equation of line ℓ is
- $y = \frac{1}{5}x + 2$
 - $y = -5x + 28$
 - $y = \frac{1}{5}x - 2$
 - $y = -5x - 28$
- 8 Which line is parallel to the line whose equation is $4x + 3y = 7$ and also passes through the point $(-5,2)$?
- $4x + 3y = -26$
 - $4x + 3y = -14$
 - $3x + 4y = -7$
 - $3x + 4y = 14$
- 9 What is the equation of a line that passes through the point $(-3,-11)$ and is parallel to the line whose equation is $2x - y = 4$?
- $y = 2x + 5$
 - $y = 2x - 5$
 - $y = \frac{1}{2}x + \frac{25}{2}$
 - $y = -\frac{1}{2}x - \frac{25}{2}$
- 10 What is an equation of the line that passes through the point $(7,3)$ and is parallel to the line $4x + 2y = 10$?
- $y = \frac{1}{2}x - \frac{1}{2}$
 - $y = -\frac{1}{2}x + \frac{13}{2}$
 - $y = 2x - 11$
 - $y = -2x + 17$
- 11 Which equation represents the line parallel to the line whose equation is $4x + 2y = 14$ and passing through the point $(2,2)$?
- $y = -2x$
 - $y = -2x + 6$
 - $y = \frac{1}{2}x$
 - $y = \frac{1}{2}x + 1$
- 12 What is the equation of a line passing through the point $(6,1)$ and parallel to the line whose equation is $3x = 2y + 4$?
- $y = -\frac{2}{3}x + 5$
 - $y = -\frac{2}{3}x - 3$
 - $y = \frac{3}{2}x - 8$
 - $y = \frac{3}{2}x - 5$
- 13 An equation of the line that passes through $(2,-1)$ and is parallel to the line $2y + 3x = 8$ is
- $y = \frac{3}{2}x - 4$
 - $y = \frac{3}{2}x + 4$
 - $y = -\frac{3}{2}x - 2$
 - $y = -\frac{3}{2}x + 2$
- 14 What is the equation of a line passing through the point $(4,-1)$ and parallel to the line whose equation is $2y - x = 8$?
- $y = \frac{1}{2}x - 3$
 - $y = \frac{1}{2}x - 1$
 - $y = -2x + 7$
 - $y = -2x + 2$
- 15 Write an equation of a line that is parallel to the line whose equation is $3y = x + 6$ and that passes through the point $(-3,4)$.
- 16 Find an equation of the line passing through the point $(5,4)$ and parallel to the line whose equation is $2x + y = 3$.
- 17 Write an equation of the line that passes through the point $(6,-5)$ and is parallel to the line whose equation is $2x - 3y = 11$.

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Answer Section

1 ANS: 2 REF: 081421ge

2 ANS: 3

$$y = mx + b$$

$$-1 = 2(2) + b$$

$$-5 = b$$

REF: 011224ge

3 ANS: 4

$$y = mx + b$$

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

$$3 = -3 + b$$

$$6 = b$$

REF: 011114ge

4 ANS: 1

$$m = \frac{3}{2} \quad y = mx + b$$

$$2 = \frac{3}{2}(1) + b$$

$$\frac{1}{2} = b$$

REF: 081217ge

5 ANS: 4

$$\frac{2}{3}(x - 4) = y - 5$$

$$2x - 8 = 3y - 15$$

$$7 = 3y - 2x$$

REF: 061528ge

6 ANS: 3

$$m = \frac{-A}{B} = \frac{-4}{-2} = 2 \quad y = mx + b$$

$$1 = 2(-2) + b$$

$$1 = -4 + b$$

$$5 = b$$

REF: 081509ge

7 ANS: 2

$$m = \frac{-A}{B} = \frac{-5}{1} = -5 \quad y = mx + b$$

$$3 = -5(5) + b$$

$$28 = b$$

REF: 011410ge

8 ANS: 2

The slope of a line in standard form is $-\frac{A}{B}$, so the slope of this line is $\frac{-4}{3}$. A parallel line would also have a slope of $\frac{-4}{3}$. Since the answers are in standard form, use the point-slope formula. $y - 2 = -\frac{4}{3}(x + 5)$

$$3y - 6 = -4x - 20$$

$$4x + 3y = -14$$

REF: 061123ge

9 ANS: 2

REF: fall0812ge

10 ANS: 4

The slope of a line in standard form is $-\frac{A}{B}$, so the slope of this line is $\frac{-4}{2} = -2$. A parallel line would also have a slope of -2 . Since the answers are in slope intercept form, find the y -intercept: $y = mx + b$

$$3 = -2(7) + b$$

$$17 = b$$

REF: 081010ge

11 ANS: 2

$$m = \frac{-A}{B} = \frac{-4}{2} = -2 \quad y = mx + b$$

$$2 = -2(2) + b$$

$$6 = b$$

REF: 081112ge

12 ANS: 3

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

$$y = \frac{3}{2}x - 2 \quad 1 = 9 + b$$

$$-8 = b$$

REF: 061316ge

13 ANS: 4

$$m = \frac{-A}{B} = \frac{-3}{2}. \quad y = mx + b$$

$$-1 = \left(\frac{-3}{2} \right) (2) + b$$

$$-1 = -3 + b$$

$$2 = b$$

REF: 061226ge

14 ANS: 1

$$m = \frac{-A}{B} = \frac{1}{2} \quad -1 = \frac{1}{2} (4) + b$$

$$-1 = 2 + b$$

$$-3 = b$$

REF: 061420ge

15 ANS:

$$m = \frac{1}{3} \quad 4 = \frac{1}{3} (-3) + b \quad y = \frac{1}{3} x + 5$$

$$4 = -1 + b$$

$$5 = b$$

REF: 011532ge

16 ANS:

$$y = -2x + 14$$

REF: 060931ge

17 ANS:

$$y = \frac{2}{3} x - 9$$

REF: 080931ge