

Lines: Lesson 7

Answers

Parallel and Perpendicular Lines: Worksheet 1

Name: _____

MATH 4 ALL

Parallel Lines: same slopes, different y-intercepts (b)

Perpendicular Lines: Slopes are opposite reciprocals.

Slope perpendicular to: -6 : $\frac{1}{6}$ $\frac{4}{3}$: $-\frac{3}{4}$ $\frac{1}{10}$: -10

Are these lines parallel, perpendicular, or neither? (Circle one.)

$y = \frac{7}{9}x + 14$ and $y = \frac{-7}{9}x - 2$ Parallel Perpendicular Neither

$y = \frac{1}{3}x - 1$ and $y = -3x - 4$ Parallel Perpendicular Neither

$y = -5x + 7$ and $y = -5x - \frac{1}{7}$ Parallel Perpendicular Neither

$4x + y = 5$ and $4y = -x - 2$ Parallel Perpendicular Neither
 $y = -4x + 5$ $y = -\frac{1x}{4} - \frac{2}{4}$

~~$-2y = 4x + 3$~~ and ~~$5y = -10x + 1$~~ Parallel Perpendicular Neither
 ~~-2~~ ~~-2~~ ~~-2~~ ~~5~~ ~~5~~ ~~5~~
 $y = -2x - \frac{3}{2}$ $y = -2x + \frac{1}{5}$

Find the equation of the line parallel to the given line and through the point:

Given line: $y = \frac{1}{3}x + 17$ Through $(6, 7)$

$m = \frac{1}{3}$ $x_1 = 6$ $y_1 = 7$ Method 1

$$y - 7 = \frac{1}{3}(x - 6)$$

$$y - 7 = \frac{1}{3}x - 2$$

$$\begin{array}{r} y - 7 \\ + 7 \\ \hline y = \frac{1}{3}x + 5 \end{array}$$

$m = \frac{1}{3}$ $x = 6$ $y = 7$ Method 2

$$7 = \frac{1}{3}(6) + b$$

$$7 = 2 + b$$

$$b = 5 \rightarrow y = \frac{1}{3}x + 5$$

Given line: $-2y = 8x - 1$ Through $(-1, 3)$

$y = -4x + \frac{1}{2}$, so $m = -4$, w/ point $(-1, 3)$

$y - 3 = -4(x + 1)$

$$y - 3 = -4x - 4$$

$$\begin{array}{r} y - 3 \\ + 3 \\ \hline y = -4x - 1 \end{array}$$

Find the equation of the line perpendicular to the given line and through the point:

Given line: $y = \frac{-5}{6}x + 2$ Through $(-6, 2)$

$m = -\frac{5}{6}$; $\perp m = \frac{6}{5}$

$$2 = \frac{6}{5} \cdot (-6) + b$$

$$2 = -\frac{36}{5} + b$$

$$\frac{36}{5} + \frac{10}{5} = b \quad b = \frac{46}{5}$$

$y = \frac{6}{5}x + \frac{46}{5}$

Given line through $(-3, 0)$ and $(-1, -1)$ Through $(4, -5)$

$m = \frac{-1 - 0}{-1 - (-3)} = \frac{-1}{2}$; $\perp m = 2$

$y + 5 = 2(x - 4)$

$$y + 5 = 2x - 8$$

$$y = 2x - 13$$