# Bellringer #10

**Write an equation of the line through each pair of points in slope-intercept form.**

**a) (0, 3) and (-2, -1)**

$x_1\ y_1$ $x_2\ y_2$

**b) (-7, 4) and (9, -4)**

$x_1\ y_1$ $x_2\ y_2$

$y - y_1 = m(x - x_1)$

$y + 4 = -\frac{1}{2}(x - 9)$

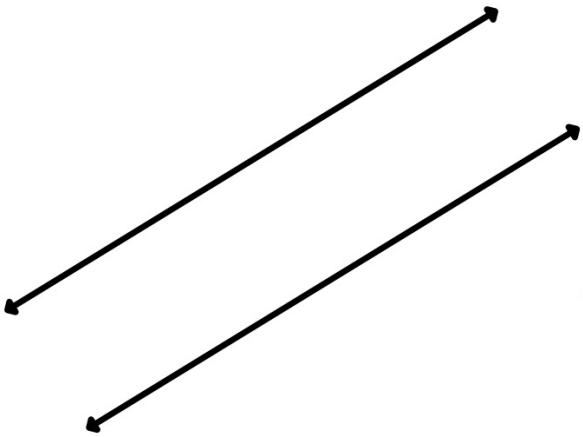
$y + 4 = -\frac{1}{2}x + \frac{9}{2}$

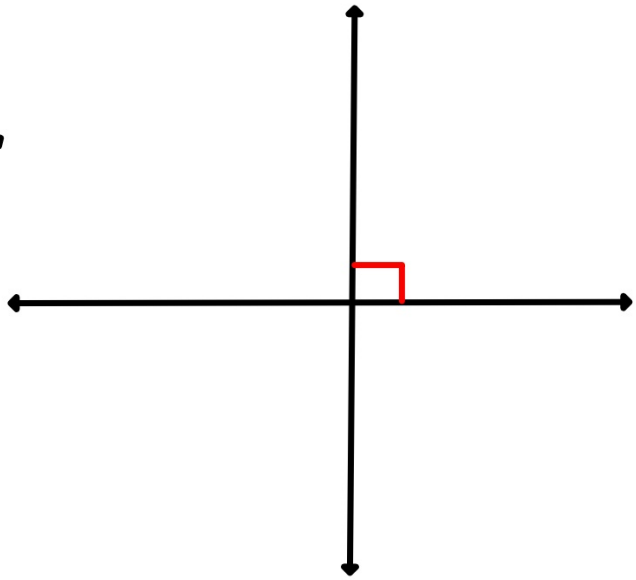
$-4 \qquad -4$

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

# Homework Questions?

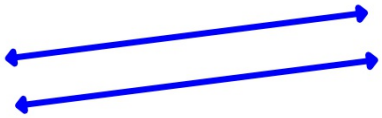
# PARALLEL AND PERPENDICULAR LINES



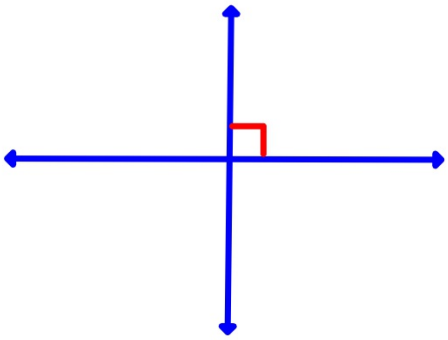


3-3 and 3-4

**PARALLEL LINES:** Lines that do not intersect. They have the same slope.



**PERPENDICULAR LINES:** Lines that intersect at a right angle (90°). They have opposite reciprocal slopes.



Writing opposite reciprocals.

- Make the slope a fraction, if not already.
- Flip the fraction.
- Change the sign. If negative make it positive.
  If positive make negative.

Examples

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

Determine whether $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are parallel, perpendicular, or neither.

Example 1.) A(1,1), B(−1,−5), C(3,2), and D(6,1)

$m = \frac{-5-1}{-1-1} = \frac{-6}{-2} = 3$ $\quad m = \frac{1-2}{6-3} = \frac{-1}{3}$

Determine whether $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are parallel, perpendicular, or neither.

Example 2.) A(14,13), B(11,0), C(−3,7), and D(−4,5)

$x_1\ y_1$ $x_2\ y_2$ $x_1\ y_1$ $x_2\ y_2$

$m = \frac{0-13}{11-14} = \frac{-13}{-3} = \frac{13}{3}$ $\quad m = \frac{5-7}{-4+3} = \frac{-2}{-1} = 2$

Determine whether $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are parallel, perpendicular, or neither.

Example 3.) A(3,6), B(−9,2), C(5,4), and D(2,3)

$x_1, y_1$ $x_2, y_2$ $x_1, y_1$ $x_2, y_2$

$$m = \frac{2-6}{-9-3} = \frac{-4}{-12} = \frac{1}{3} \qquad m = \frac{3-4}{2-5} = \frac{-1}{-3} = \frac{1}{3}$$

Determine whether the two lines are parallel, perpendicular or neither.

Example 4.) $y = 2x - 3$ and $y = 2x + 5$

parallel

Example 5.) $y = 3$ and $x = -1/3$

m=0 m = undefined

perp.

Determine whether the two lines are parallel, perpendicular or neither.

Example 6.) $y = 3x - 5$ and $3x - 2y = 4$

$-3x \qquad -3x$

$-2y = -3x + 4$

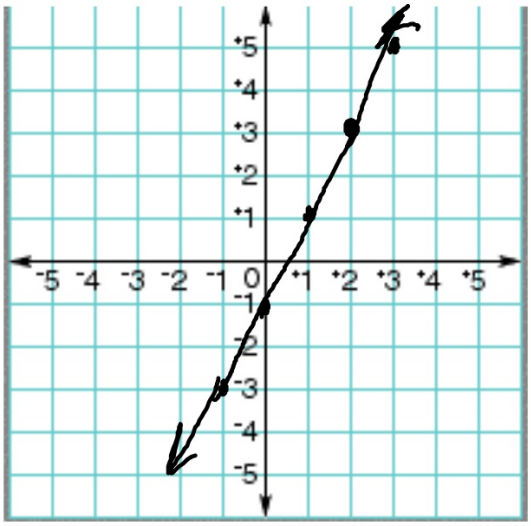
$\frac{-2y}{-2} = \frac{-3x}{-2} + \frac{4}{-2}$

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

## Graphing

Graph the following.

Example 7.) A line parallel to $y = 2x - 1$ and passes through $(2,3)$.

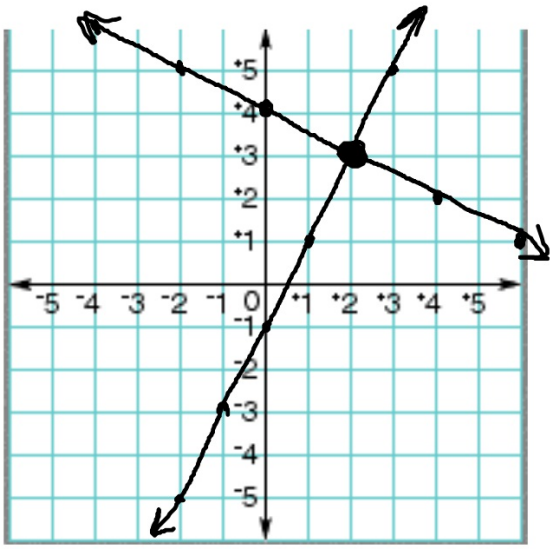


## Graphing

Graph the following.

Example 8.) A line perpendicular to $y = 2x - 1$ and passes through (2,3)

$m = -\frac{1}{2}$



## Writing Equations

Example 10.) Write the equation of a line perpendicular to $y = -3x + 2$ and passes through $(\overset{x_1}{4}, \overset{y_1}{0})$ $\quad m = \frac{1}{3}$

$$y - 0 = \frac{1}{3}(x - 4)$$

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

## Writing Equations

Example 11.) Write the equation of a line parallel to $y = 2x - 5$ and passes through $(-1, 3)$ ($x_1, y_1$)

$m = 2$

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

$y - 3 = 2x + 2$

$+3 \quad +3$

$y = 2x + 5$

# Assignment

# Parallel and Perpendicular Lines Worksheet

## Assignment

Skills Practice 3-3 #7-14

Practice 3-3 # 7-14

Skills Practice 3-4 #13,14

Practice 3-4 #10,11