

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{Slope} = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x}$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - (-5)}{4 - 6} = \frac{3 + 5}{4 - 6} = \frac{8}{-2} = -4$$

slope = $\frac{-4}{1}$ $\frac{\text{down } 4}{1 \text{ right}}$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-5 - 3}{6 - 4} = \frac{-8}{2} = -4$$

$$\begin{matrix} x_1 & y_1 \\ (2, & -8) \end{matrix} \quad \begin{matrix} x_2 & y_2 \\ (-4, & 6) \end{matrix}$$

$$\begin{matrix} x_1 & y_1 \\ (-1, & -3) \end{matrix} \quad \begin{matrix} x_2 & y_2 \\ (1, & 7) \end{matrix}$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{6 - (-8)}{-4 - 2} = \frac{6 + 8}{-4 - 2} = \frac{14}{-6} = -\frac{7}{3}$$

$$\frac{14 \div 2}{-6 \div 2} = \boxed{-\frac{7}{3}}$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - (-3)}{1 - (-1)} = \frac{7 + 3}{1 + 1} = \frac{10}{2} = 5$$

$$\frac{10}{2} = \boxed{5}$$

Slope-Intercept Form

$$y = mx + b$$

↑ slope ↑ y-intercept

$$y = mx + b$$

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

$$\text{slope} = -\frac{2}{3} = m$$

$$\text{y-intercept} = 4 = b$$

$$\text{slope} = \frac{7}{2}$$

$$\text{y-intercept} = -\frac{2}{9}$$

$$\boxed{y = \frac{7}{2}x - \frac{2}{9}}$$

Linear Equation

$$\text{slope} = 2 = m$$

through $(-1, 8)$
 ↑ ↑
 x y

$$y = mx + b$$

$$y = 2x + 10$$

1.

$$y = mx + b$$

slope-intercept form

Find b

$$8 = (2)(-1) + b$$

$$8 = -2 + b$$

$$+2 \quad +2$$

$$10 = b$$

2.

Point-Slope Form

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

$$\text{slope} = 2 = m$$

through $(-1, 8)$
 ↑ ↑
 x_1 y_1

$$(x_2 - x_1)m = \left(\frac{y_2 - y_1}{x_2 - x_1} \right) (x_2 - x_1)$$

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

$$y - 8 = 2(x - (-1))$$

$$y - 8 = 2(x + 1)$$

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

+8 +8

$$y = 2x + 10$$

$$\text{slope} = -3$$

through

$$(8, 4)$$

$$y = mx + b$$

$$4 = (-3)(8) + b$$

$$4 = -24 + b$$
$$+24 \quad +24$$

$$28 = b$$

$$y = mx + b$$

$$y = -3x + 28$$

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

$$y - 4 = -3(x - 8)$$

$$y - 4 = -3x + 24$$
$$+4 \quad +4$$

$$y = -3x + 28$$

$$\text{slope} = -\frac{1}{2}$$

through $(2, -6)$

$$y = mx + b$$

$$-6 = \left(-\frac{1}{2}\right)(2) + b$$

$$-6 = -1 + b$$

$$+1 \quad +1$$
$$-5 = b$$

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

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

-3 ← y-intercept

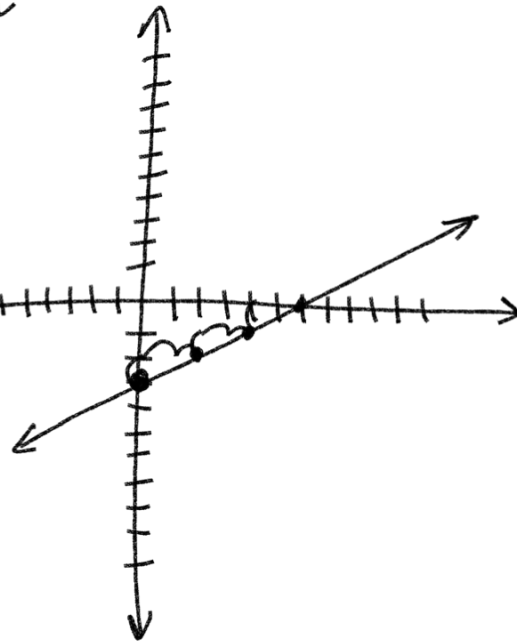
1st point

Plot the y-intercept

2nd point

Use slope

$$\text{slope} = \frac{1}{2} = \frac{\text{up } 1}{2 \text{ right}}$$



Standard Form

$$Ax + By = C$$

Trust Slope-Intercept

$$4x + 8y = 16$$

$-4x \qquad -4x$

$$\frac{8y}{8} = \frac{-4x + 16}{8}$$

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

$$\Sigma 4x + 8y = 16$$

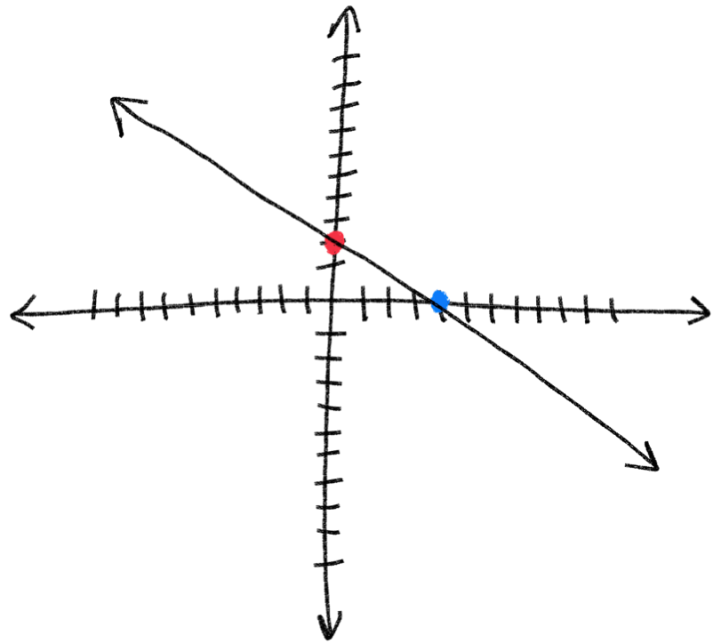
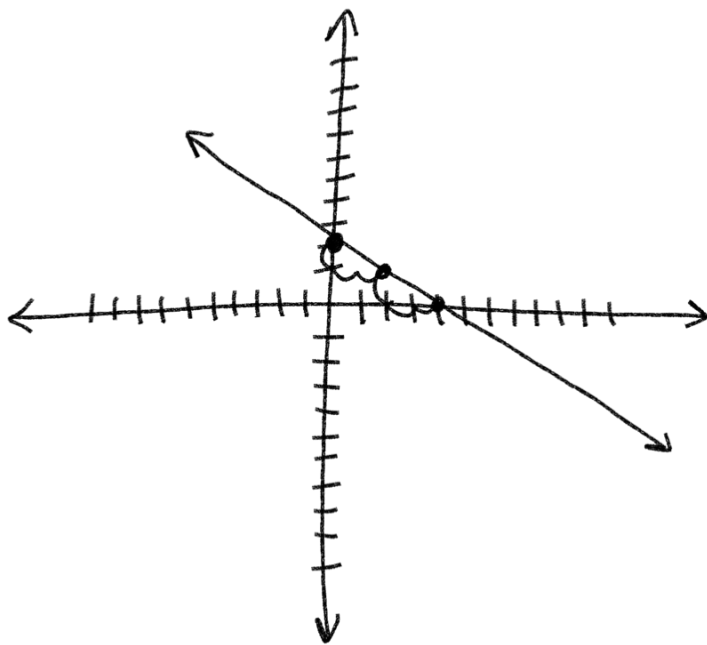
use intercepts

$$\cancel{4x} + \frac{8y}{8} = \frac{16}{8}$$

$x=0 \qquad y=2 \qquad (0,2)$

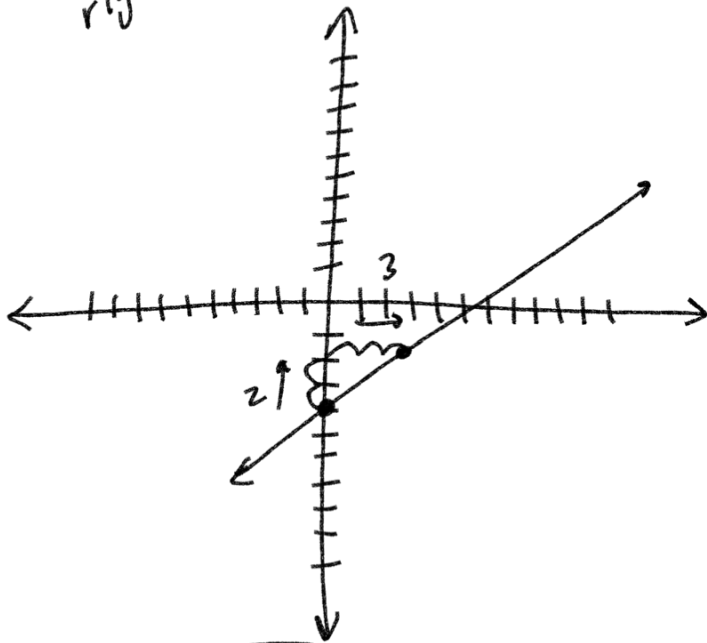
$$4x + \cancel{8y} = \frac{16}{4}$$

$y=0 \qquad x=4 \qquad (4,0)$



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

up 2
right 3



$$\boxed{\begin{matrix} x_1 & y_1 \\ (2, & 3) \end{matrix}}$$

$$\begin{matrix} x_2 & y_2 \\ (4, & -7) \end{matrix}$$

$$\text{slope } \frac{y_2 - y_1}{x_2 - x_1} = \frac{-7 - 3}{4 - 2} = \frac{-10}{2} = \boxed{-5}$$

$$y = mx + b$$

$$3 = (-5)(2) + b$$

$$3 = -10 + b$$

$$+10 \quad +10$$

$$13 = b$$

$$\boxed{y = -5x + 13}$$

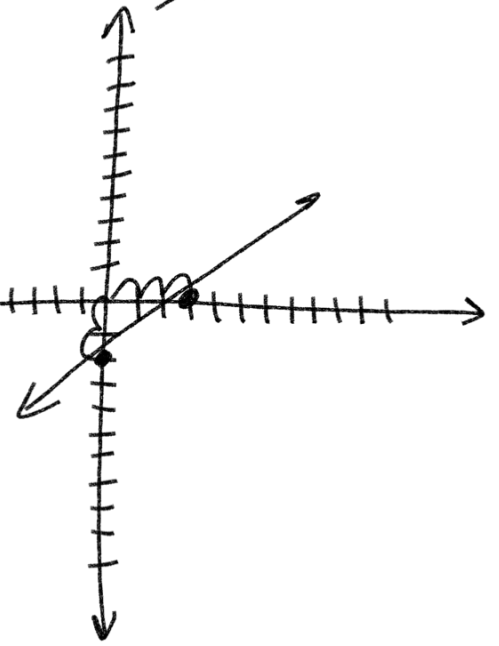
$$2x - 3y = 6$$

$$-2x$$

$$-2x$$

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

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



Write the equation

$$\text{slope} = -5$$

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

HW
Ch 3-5 evens
Supplemental WS
Online HW14 }
Quiz14 } Jan 14th