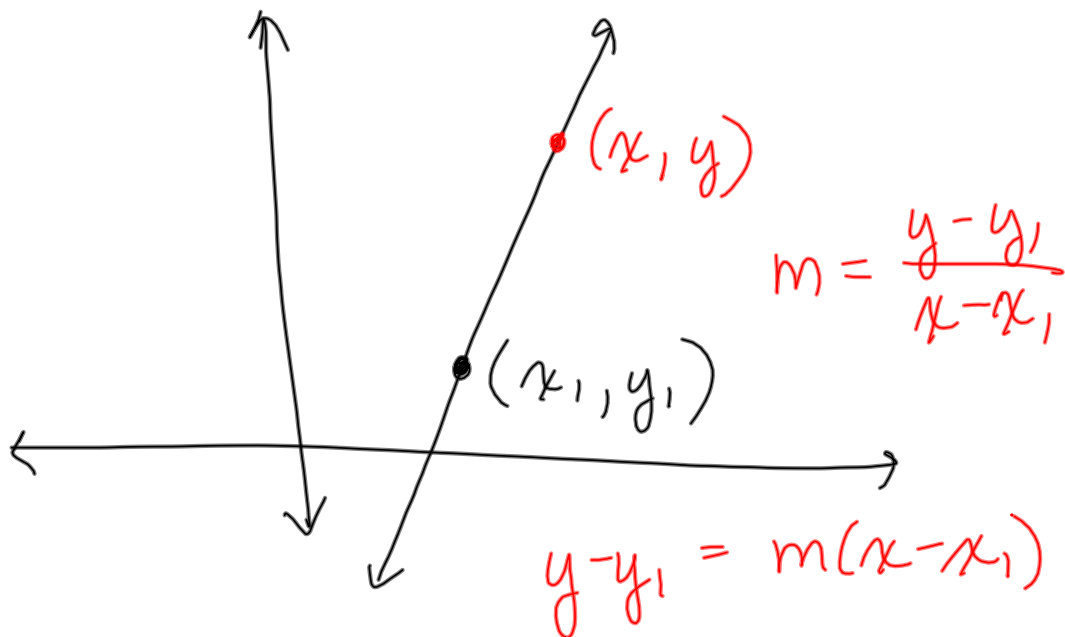


Sec. 5.4 Point - Slope Form

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

$$(x_2 - x_1)m = \frac{y_2 - y_1}{\cancel{x_2 - x_1}} \cdot \cancel{(x_2 - x_1)}$$

$$y_2 - y_1 = m(x_2 - x_1)$$



Problem 1:

A line passes through $(1, -4)$ and has slope 3 . What is an equation of the line in point-slope form.

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

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

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

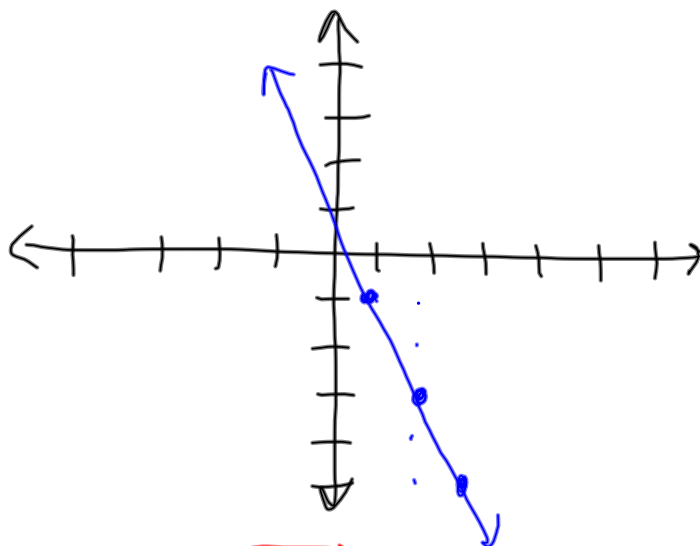
Problem 2:

a. Graph $y + 3 = -2(x - 2) \rightarrow x_1 = 2$
 $y_1 = -3$
 $y - y_1 = m(x - x_1)$

$$(x_1, y_1)$$

$$(2, -3)$$

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



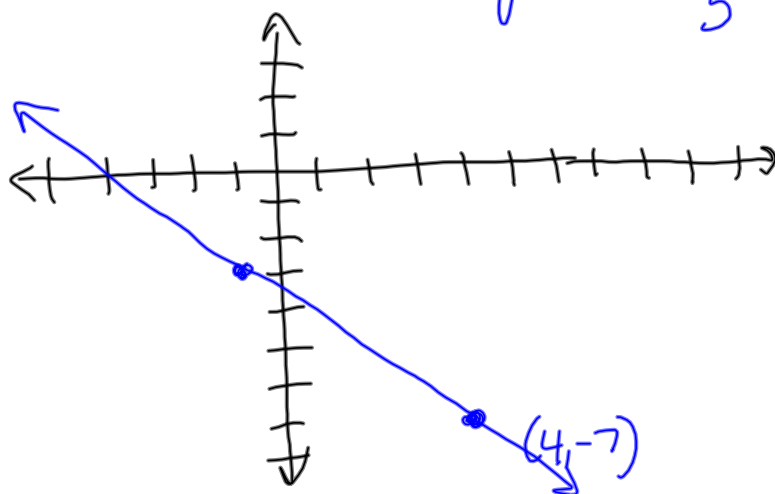
b. Graph

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

$$y + 7 = -\frac{4}{5}(x - 4)$$

point: $(4, -7)$

slope: $-\frac{4}{5}$ $\frac{4}{5}$ or $\frac{4}{-5}$

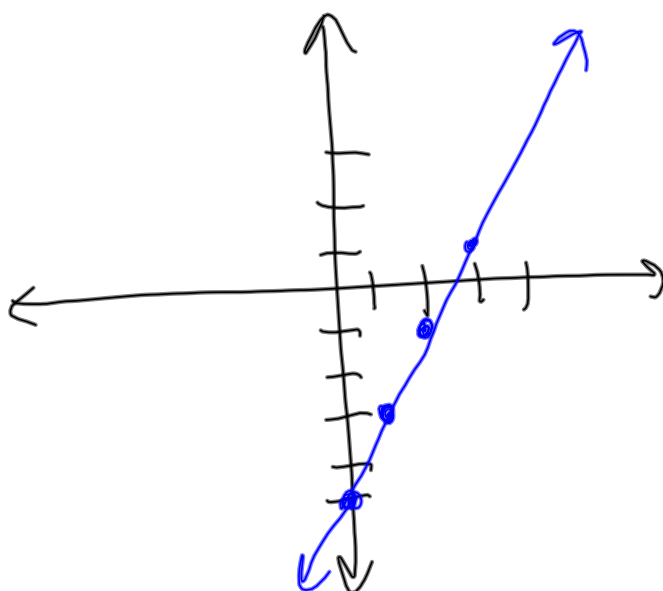


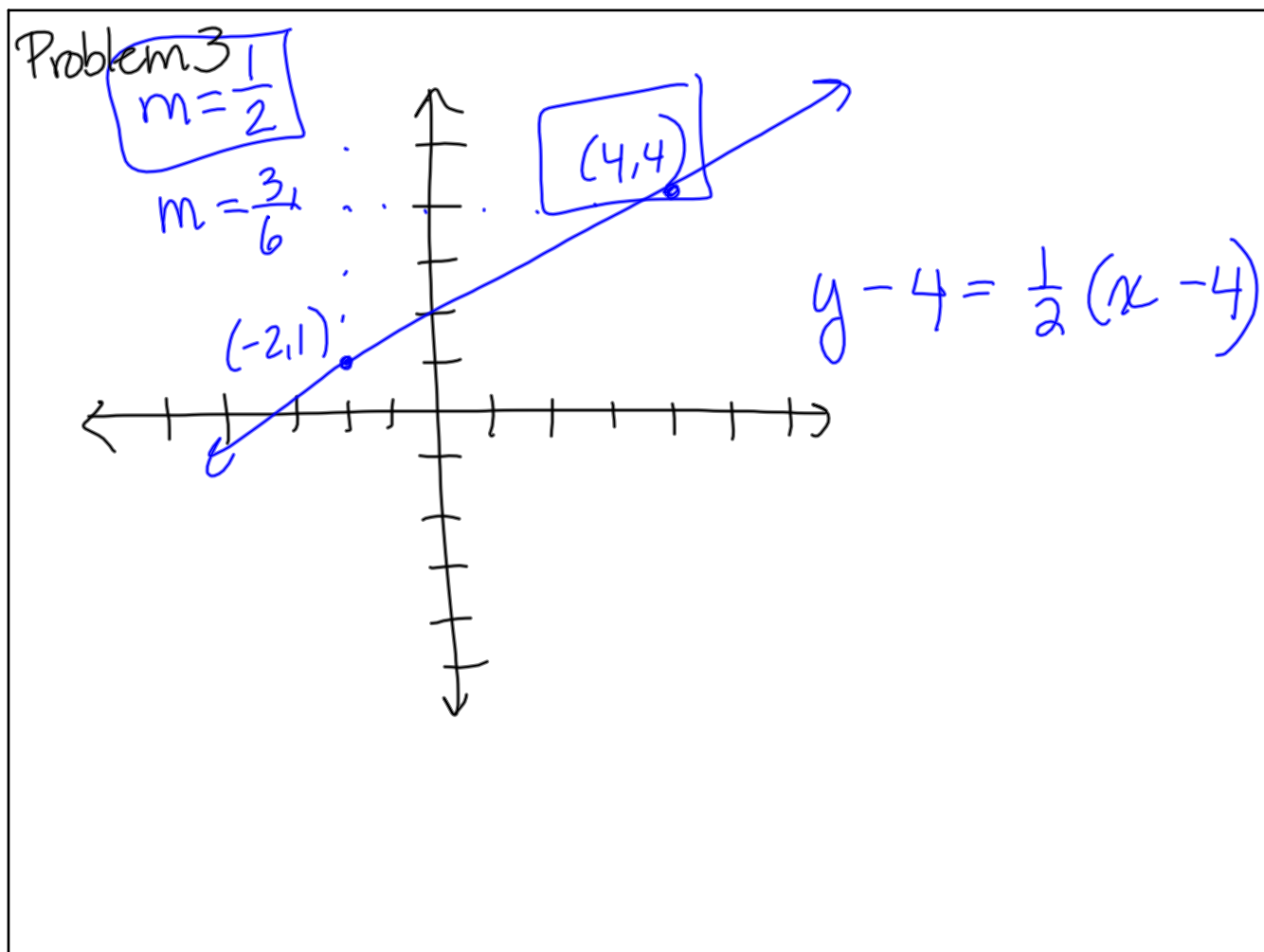
c. Graph $y + 3 = 2(x - 1)$

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

$$(x_1, y_1) = (1, -3)$$

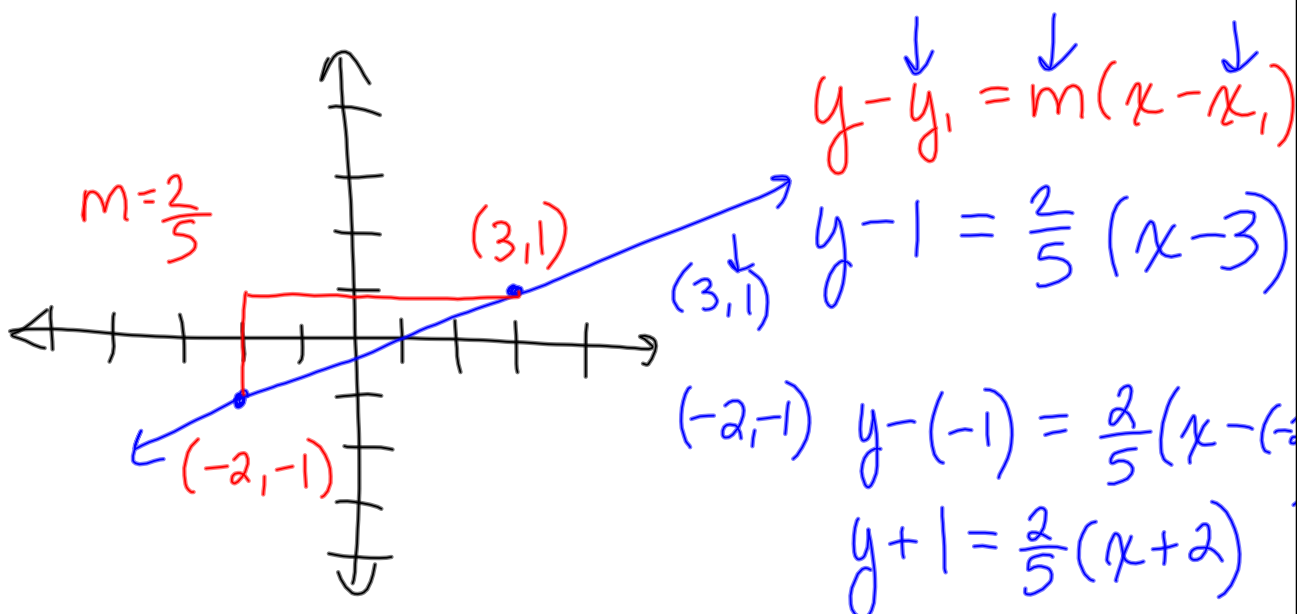
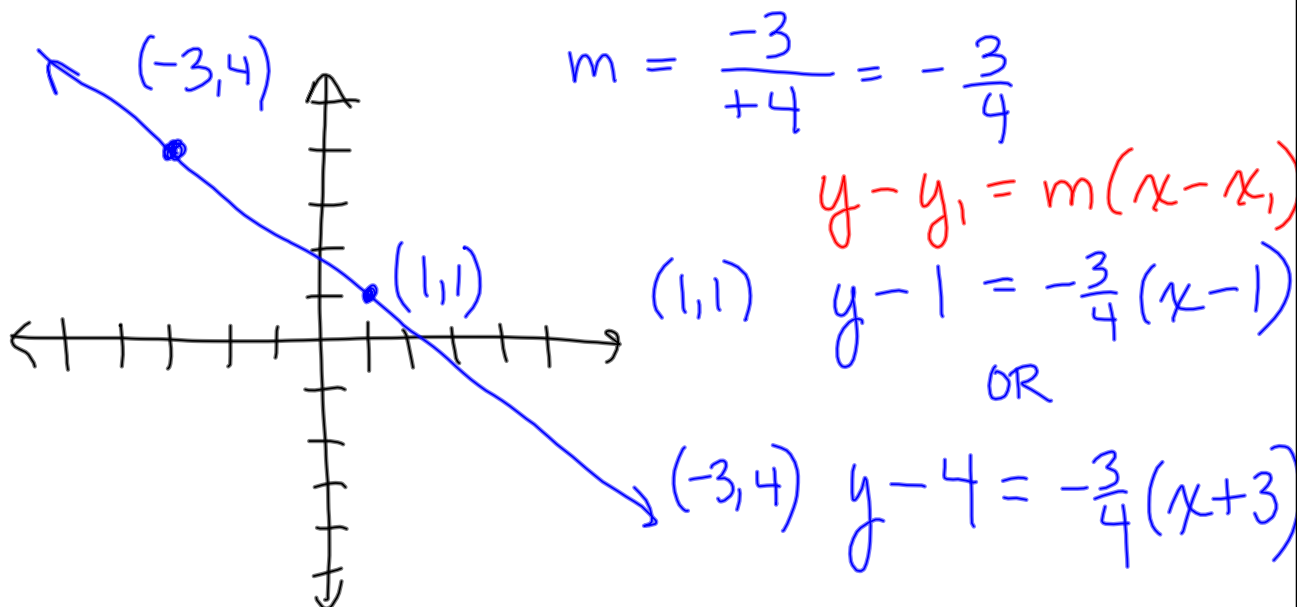
$$m = \frac{2}{1}$$





Problem 3:

Write an equation in point-slope form of the line shown below.



Problem 4

Julio's Earnings

Hr Worked	Wages
5 x_1	\$130 y_1
10	\$210
15	\$290
20	\$370

$\Delta x = 5$ (indicated by a blue arrow pointing from 5 to 10)
 $\Delta y = \$80$ (indicated by a blue arrow pointing from \$130 to \$210)

a. Equation:

$$m = \frac{\Delta y}{\Delta x} = \frac{80}{5} = \frac{\$80}{5} = \frac{\$16}{1} = \frac{\$16}{\text{hr}}$$

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

$$y - 130 = 16(x - 5)$$

slope-intercept

$$y - 130 = 16x - 80$$

$$+130 \qquad +130$$

$$\boxed{y = 16x + 50}$$

b. What do the slope and y-intercept represent?

The slope is hourly pay rate.

The y-intercept is a fixed amount of income per pay period.

• x • x • x • x • x • x

Point - Slope
Form

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

slope

y-coordinate of point

x-coordinate of point

Write Equation (Given slope & point)

Write Equation (Given two points)

Graph Equation (Given point-slope form)

Example:

Write the equation of the line that passes through the point $(2, -3)$ and has a slope of -4 .

Solution process:

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

$$y - (-3) = -4(x - 2)$$

$$y + 3 = -4(x - 2)$$

Write Equation (Given slope & point)

Example:

Write the equation of the line that passes through the points $(2, -3)$ and $(4, 7)$.

Solution process:

$$\begin{aligned} \text{slope} = m &= \frac{y_2 - y_1}{x_2 - x_1} = \frac{7 - (-3)}{4 - 2} \\ &= \frac{10}{2} = 5 \end{aligned}$$

choose 1 of the points above

$$\begin{aligned} (4, 7) \quad y - y_1 &= m(x - x_1) \\ m = 5 \quad y - 7 &= 5(x - 4) \end{aligned}$$

Given two points

