

Sec. 5.4 Point-Slope Form

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

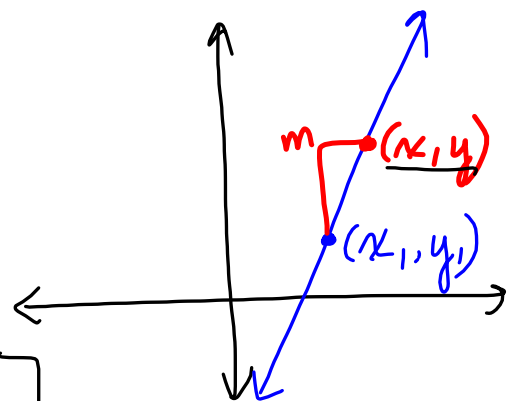
$$m(x_2 - x_1) = y_2 - y_1$$

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

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

y-coordinate

x-coordinate



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

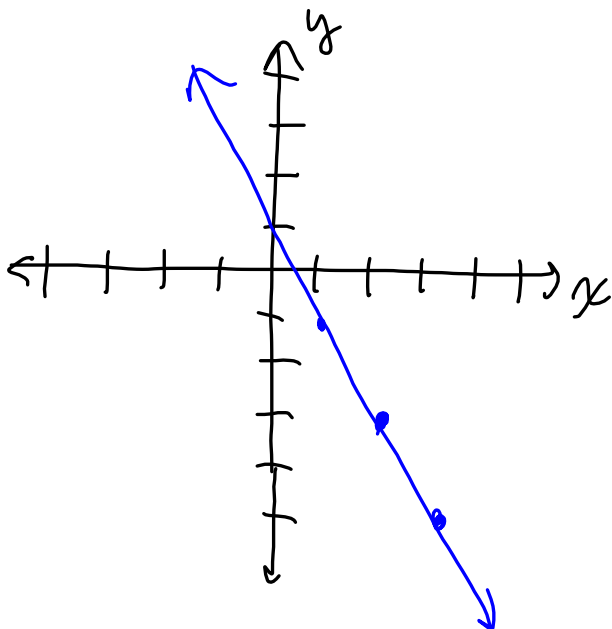
Problem 1: Write an equation in point-slope form for a line which passes through $(1, -4)$ and has slope 3.

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

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

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

Problem 2: Graph $y + 3 = -2(x - 2)$



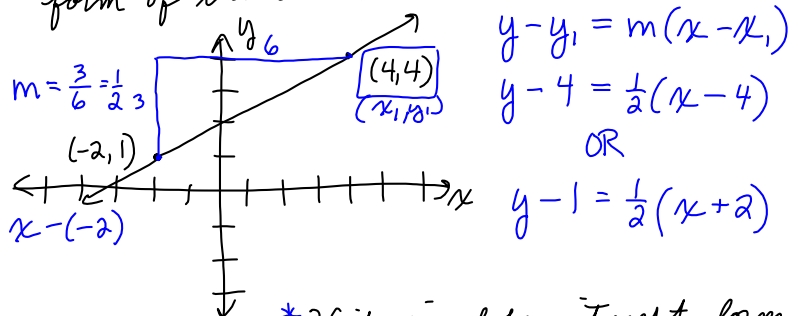
$$y - y_1 = m(x - x_1)$$

$$y - (-3) \quad x - (2)$$

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

$$(2, -3)$$

Problem 3: Write an equation in point-slope form of the line below.



* Write in slope-intercept form.
 ① Distribute m
 ② Add/subtract y_1

$$\begin{array}{l}
 y - 4 = \frac{1}{2}(x - 4) \\
 y - 4 = \frac{1}{2}x - 2 \\
 \quad + 4 \quad \quad + 4 \\
 \hline
 y = \frac{1}{2}x + 2
 \end{array}
 \qquad
 \begin{array}{l}
 y - 1 = \frac{1}{2}(x + 2) \\
 y - 1 = \frac{1}{2}x + 1 \\
 \quad + 1 \quad \quad + 1 \\
 \hline
 y = \frac{1}{2}x + 2
 \end{array}$$

Problem 4: The table shows the amount of time Julio works and his total wages. What equation in slope-intercept form gives Julio's wages at any time? What do the slope and y-intercept represent?

Julio's earnings

Hours Worked	Wages
5	\$ 130
10	\$ 210
15	\$ 290
20	\$ 370

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

$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\begin{array}{l}
 y - y_1 = m(x - x_1) \\
 y - 130 = 16(x - 5) \\
 y - 130 = 16x - 80 \\
 \quad + 130 \quad \quad + 130 \\
 \hline
 y = 16x + 50
 \end{array}$$

$m = 16 \rightarrow$ \$16 per hour
 hourly pay rate

$y\text{-int} = 50 \rightarrow$ \$50 fixed amount
 of income per pay
 period