

## 4.7 Writing Equations in Point-Slope Form p. 184

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

\* The line passes through the point  $(x_1, y_1)$  and the slope of the line is  $m$ .

Write an equation in point-slope form:

a) passes through point  $(-6, 1)$  w/ slope of  $\frac{2}{3}$

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

$$\begin{array}{ccc} \downarrow & \downarrow & \downarrow \\ y - 1 & = & \frac{2}{3}(x - -6) \end{array} \quad \text{*no double signs}$$

$$y - 1 = \frac{2}{3}(x + 6)$$

b)  $(1, 2); m = -4$        $y - 2 = -4(x - 1)$

c)  $(7, 0); m = 1$        $y - 0 = 1(x - 7)$   
 $y = x - 7$

d)  $(-8, -5); m = -\frac{3}{4}$        $y - (-5) = -\frac{3}{4}(x - -8)$

$$y + 5 = -\frac{3}{4}(x + 8)$$

Using 2 points:

a)  $(2, 4), (5, -2)$       \* first find the slope  $\frac{4 - (-2)}{2 - 5} = \frac{6}{-3} = -2$

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

\* use either point to write the equation

\* Now in slope-intercept form

$$y - 4 = -2x + 4$$

\* solve for  $y$

$$y = -2x + 8$$

Write in slope-intercept form:

a)  $(-2, 1), (3, -4)$

$$\frac{1 - (-4)}{-2 - 3} = \frac{5}{-5} = -1$$

$$y - 1 = -1 \left( \frac{x - (-2)}{(x+2)} \right)$$

$$y - 1 = -x - 2$$

$$\boxed{y = -x - 1}$$

b)  $(-5, -5), (-3, 3)$

$$\frac{-5 - 3}{-5 - (-3)} = \frac{-8}{-2} = 4$$

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

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

$$y + 5 = 4x + 20$$

$$\boxed{y = 4x + 15}$$

c)  $(-8, 6), (-2, 9)$

$$\frac{6 - 9}{-8 - (-2)} = \frac{-3}{-6} = \frac{1}{2}$$

$$y - 6 = \frac{1}{2}(x - (-8))$$

$$y - 6 = \frac{1}{2}x + 4$$

$$\boxed{y = \frac{1}{2}x + 10}$$