

### 3.3.12: Converting from Point-Slope to Slope-Intercept Form

Write an equation in point-slope form that passes through (1, 7) and has a slope of 2.

$x_1, y_1$   
 $m$

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

$$y - 7 = 2(x - 1)$$

$$\begin{array}{r} y - 7 = 2x - 2 \\ +7 \quad +7 \\ \hline y = 2x + 5 \end{array}$$

$$y = mx + b$$

Rewrite the equation in slope-intercept form.

Verify your equations are the same line on Desmos.

Write an equation in point-slope form that passes through (-12, 15) and has a slope of  $\frac{1}{4}$ .

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

$$y - 15 = \frac{1}{4}(x + 12)$$

$$\begin{array}{r} y - 15 = \frac{1}{4}x + 3 \\ +15 \quad +15 \\ \hline y = \frac{1}{4}x + 18 \end{array}$$

$$y = mx + b$$

Rewrite the equation in slope-intercept form.

Verify your equations are the same line on Desmos.

Write an equation in point-slope form that passes through (5, -8) and has a slope of -6.

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

$$y + 8 = -6(x - 5)$$

$$\begin{array}{r} y + 8 = -6x + 30 \\ -8 \quad -8 \\ \hline y = -6x + 22 \end{array}$$

$$y = mx + b$$

Rewrite the equation in slope-intercept form.

Verify your equations are the same line on Desmos.

Write an equation in point-slope form that passes through (-5, -5) and (-2, 4).

$x_1, y_1$     $x_2, y_2$

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

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - (-5)}{-2 - (-5)} = \frac{9}{3} = 3$$

$$y + 5 = 3(x + 5)$$

$$\begin{array}{r} y + 5 = 3x + 15 \\ -5 \quad -5 \\ \hline y = 3x + 10 \end{array}$$

$$y = mx + b$$

Rewrite the equation in slope-intercept form.

Verify your equations are the same line on Desmos.

Write an equation in point-slope form that passes through  $(-3, 9)$  and  $(6, 3)$ .

$x_1, y_1$      $x_2, y_2$

Rewrite the equation in slope-intercept form.

Verify your equations are the same line on Desmos.

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

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

$$y - 9 = -\frac{2}{3}(x + 3)$$

$$\begin{array}{r} y - 9 = -\frac{2}{3}x - 2 \\ +9 \qquad \qquad +9 \end{array}$$

$$y = -\frac{2}{3}x + 7$$

$$y = mx + b$$