

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

Lesson 6: Point-Slope Form of a Linear Equation - 2

More Examples:

1) Write an equation for the line (in both point-slope and slope-intercept form) that passes through (1, -1) and is:

a) parallel to the line $y = \frac{2}{3}x - 5$

x_1 y_1
point

$$m = \frac{2}{3}$$

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

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

$$y = \frac{2}{3}x - \frac{5}{3}$$

slope-int

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

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

$$-\frac{2}{3} - 1 = -\frac{2}{3} - \frac{3}{3} = -\frac{5}{3}$$

point-slope

b) perpendicular to the line $y = \frac{2}{3}x - 5$

$$P(1, -1) \quad m = -\frac{3}{2}$$

$x_1 \quad y_1$

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

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

point slope

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

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

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

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

slope int.

2) Write an equation for the line (in both point-slope and slope-intercept form) that passes through (2, -3) and is:

a) parallel to the line $y = 3x + 5$

$$P(x_1, y_1) \quad m = 3$$

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

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

point-slope

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

$$y + 3 = 3x - 6$$

$$y = 3x - 9$$

slope-int

b) perpendicular to the line $y = 3x + 5$

$\nearrow \frac{3}{1}$

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

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

point-slope

$$m = -\frac{1}{3} \quad P(x_1, y_1)$$

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

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

$$y = -\frac{1}{3}x - \frac{7}{3}$$

slope-int.

$$\frac{2}{3} - 3 = \frac{2}{3} - \frac{9}{3} = -\frac{7}{3}$$