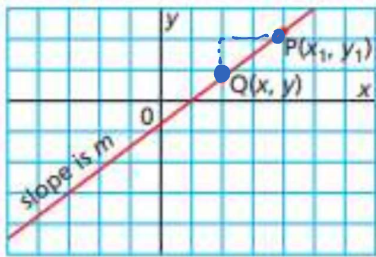


# 5.4 Part 1

Tuesday, May 2, 2023 3:31 PM

## 5.4 Slope-Point Form of the Equation for a Linear Function = Part 1

### Line



#### The equation of a line in slope point form

The equation of a line with slope  $m$  that passes through the point  $P(x_1, y_1)$  is :

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

$m = \text{slope}$   
 $\text{point } (x_1, y_1)$

To write the equation for a linear function, we need a point and the slope.

**Example 1 :** Determine the slope of the line that corresponds to each equation and the coordinates of a point on that line.

a)  $y - 3 = -5(x - 2)$   
 $y - y_1 = m(x - x_1)$   
 $m = -5$  point  $(x_1, y_1)$   
 $y_1 = 3$   $x_1 = 2$   $(2, 3)$

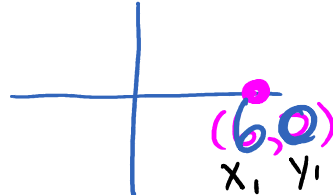
b)  $y + 6 = \frac{1}{4}(x - 1)$   
 $y - y_1 = m(x - x_1)$   $m = \frac{1}{4}$   
 $y + 6$   $x_1 = 1$   
 $y - (-6) = \frac{1}{4}(x - 1)$  point  $(x_1, y_1)$   
 $y_1 = -6$   $(1, -6)$

**Example 2 :** Write the equation of the line in slope point form :

a) with a slope of  $\frac{3}{2}$  and passing through the point  $P(-3, 7)$   
 $m = \frac{3}{2}$   $(x_1, y_1)$   $x_1 = -3$   $y_1 = 7$   
 $y - y_1 = m(x - x_1)$   
 $y - 7 = \frac{3}{2}(x - (-3))$   
 $y - 7 = \frac{3}{2}(x + 3)$

b) with a slope of  $-4$  and a x-intercept 6.

$m = -4$  x intercept 6



$y - y_1 = m(x - x_1)$   
 $y - 0 = -4(x - 6)$   
 $y = -4(x - 6)$

**Example 3 :** Describe the linear function and graph it.

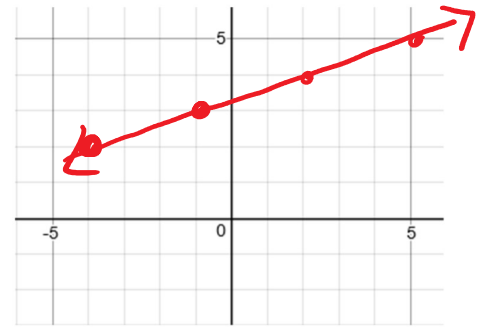
$$y - 2 = \frac{1}{3}(x + 4)$$

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

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

$y_1 = 2$   
 $x_1 = -4$  → point  $(x_1, y_1)$   
 $(-4, 2)$   
 $m = \frac{1}{3}$

$m = \frac{1}{3}$  rise 1 run = 3 →



**Example 4 :** Write an equation for the line using the slope and a point.

point =  $(-1, -2)$  slope =  $\uparrow 3 \rightarrow 4$   
 $x_1, y_1$   $m = \frac{3}{4}$

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

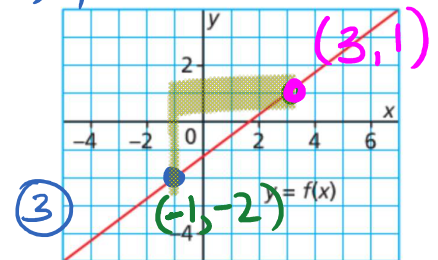
$$y - (-2) = \frac{3}{4}(x - (-1))$$

$$y + 2 = \frac{3}{4}(x + 1)$$

$$y = \frac{3}{4}(x + 1) - 2$$

$$y = \frac{3}{4}x + \frac{3}{4} - 2$$

$$y = \frac{3}{4}x - 1.25$$



$$y - 1 = \frac{3}{4}(x - 3)$$

$$y = \frac{3}{4}(x - 3) + 1$$

$$y = \frac{3}{4}x - \frac{9}{4} + 1$$

$$y = \frac{3}{4}x - 1.25$$

**Practice:** p.372 #4 - 7, 9, 12

Mrs. Shaw

F & PC 10