Equations for a Line

- **Slope-Intercept Form** $y = mx + b$
- **Standard Form** $Ax + By = C$
- **Point-Slope Form** $y - y_1 = m(x - x_1)$

A line passes through the following two points:
(0, 7) and (-2,0)

$m = \frac{7-0}{0-(-2)} = \frac{7}{2}$

Write the equation of this line in Point-Slope Form.

Use (0,7)

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

Use (-2,0)

$y = \frac{7}{2}(x+2)$

A line passes through the following two points:
(-5, 8) and (2, 8)

$m = \frac{0}{7} = 0$

Write the equation of this line in Point-Slope Form.

$y - 8 = 0(x-2)$

$y - 8 = 0$

$y = 8$

A line passes through the following two points:
(6,-1) and (6, 3)

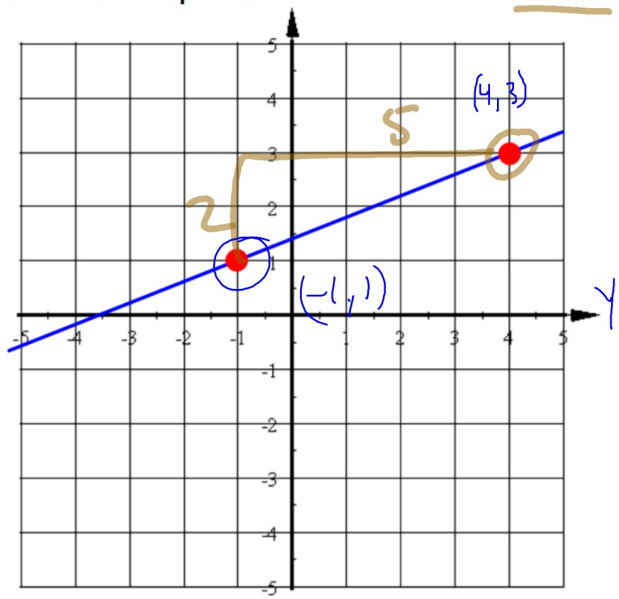
$m = \frac{4}{0}$ undefined

Write the equation of this line in Point-Slope Form.

This is a Vertical line.
You can't write the equation of a Vertical Line in Point-Slope Form.

The equation of this line is: $X = 6$

Write the equation of this line in Point-Slope Form



$y-3=\frac{2}{5}(x-4)$ or $y-1=\frac{2}{5}(x+1)$

Use this equation: $y - 9 = 4(x + 11)$

What is the slope of this line? $m=4$

What point was used to write this equation? $(-11, 9)$

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

$$y - 9 = 4(x + 11)$$

$y_1 = 9$ $\quad x_1 = -11$

Use this equation: $y + 11 = -(x - 6)$

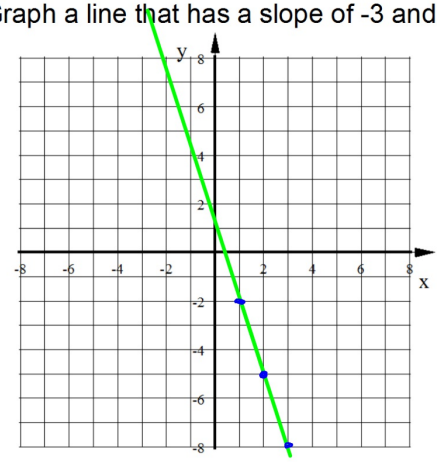
What is the slope of this line? $m=-1$

What point was used to write this equation? $(6, -11)$

To graph a line the minimum information you need is

- A point on the line and the slope
  OR
- Two points on the line.

Graph a line that has a slope of -3 and contains the point (2, -5)



Plot the point (2, -5)
and use the slope of -3
to find other points.

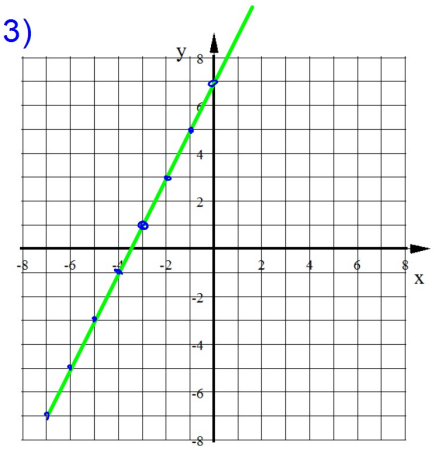
Graph this line: $y - 1 = 2(x + 3)$

What is the slope of this line? $\frac{2}{1}$

What point was used to write this equation?

$(-3, 1)$

Plot (-3,1) and use the slope to find other points.



What is another way to graph this line?

$y - 1 = 2(x + 3)$

Change this equation into Slope-Intercept Form

$y = mx + b$

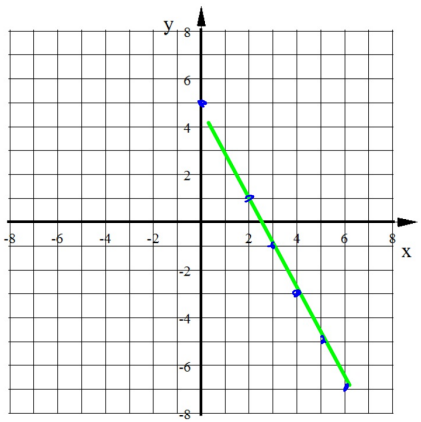
distribute the slope: $y - 1 = 2x + 6$
Add 1 to both sides: $y = 2x + 7$

Graph this line:
$y + 3 = -2(x - 4)$

Turn this equation into
the slope: m= -2
and a point: (4, -3).
Plot the point and use the slope to find other points.

Or, rewrite the equation into Slope-Intercept Form:

$y = -2x + 5$

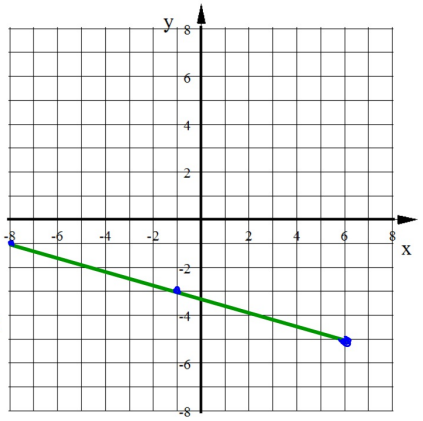


Graph this line:

$$y + 5 = -\frac{2}{7}(x - 6)$$

Plot the point (6,-5) then use the slope to find other points.

Writing this equation into Slope-Intercept Form would lead to a fractional y-intercept therefore, that method shouldn't be use.



You can now finish Hwk #25: Sec 6-4.

Pages 307-308

Problems 11-14, 21, 22, 37, 38, 40

(for 21, 22, 40 write eq in Point-Slope Form only)