



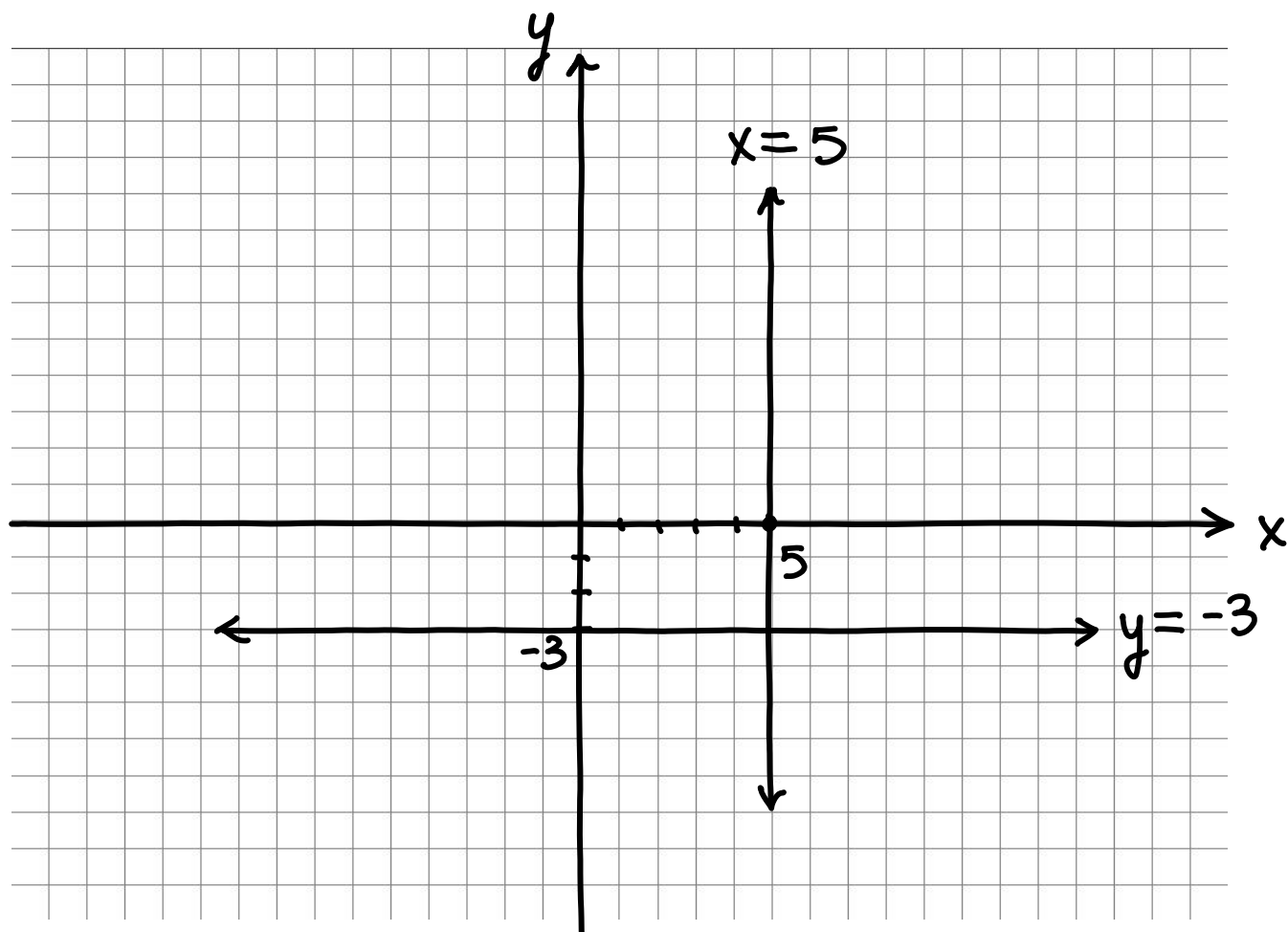
### Graphing Lines with One Variable

$$x = 5$$

$$y = -3$$

$x = \text{number}$ , vertical line

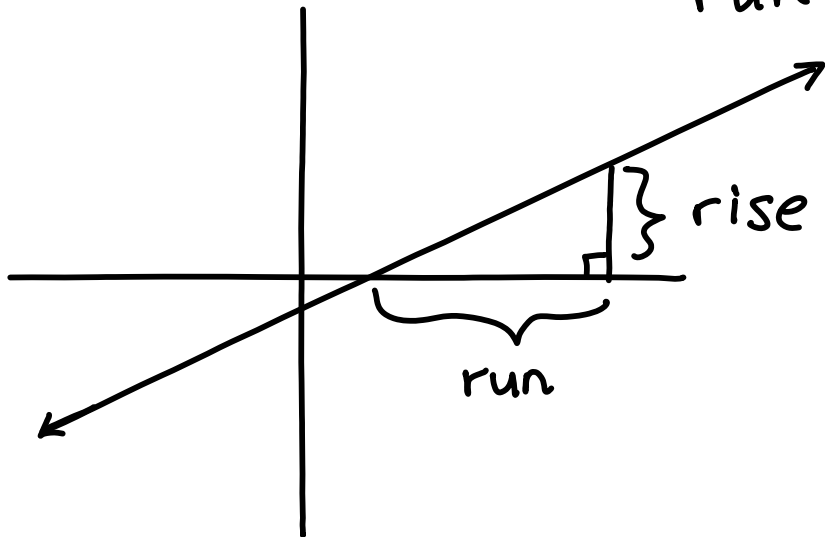
$y = \text{number}$ , horizontal line





## Slope of a Line

Defined as  $m(\text{slope}) = \frac{\text{rise}}{\text{run}}$



$$\text{Slope formula} = m = \frac{y_1 - y_2}{x_1 - x_2}$$

$$\begin{array}{cccc} x_1 & y_1 & x_2 & y_2 \\ \downarrow & \downarrow & \downarrow & \downarrow \end{array}$$

$$(1, 6), (2, 3)$$

← these points are on the line

$$m = \frac{6 - 3}{1 - 2} = \frac{3}{-1} = -3$$

$$\text{slope} = -3$$



# Graphing Lines with Two Variables

## Three methods

1. Construct a table
2.  $y = mx + b$  slope-intercept method
3. X and Y Intercept Method

## Graphing a line using a table

1. Construct a table by plugging in a x-value into the equation
2. Next solve for y
3. The x-value and y solution are a point on the line (x, y)

Example, graph  $y + 2x = 6$

$$y + 2x = 6$$

plug-in 1, then solve for y

$$y + 2(1) = 6$$

$$y + 2 = 6$$

$$y = 4$$

x	y
1	4
5	

the point (1, 4) is on the line, try another x-value,  $x = 5$

$$y + 2x = 6$$

$$y + 2(5) = 6$$

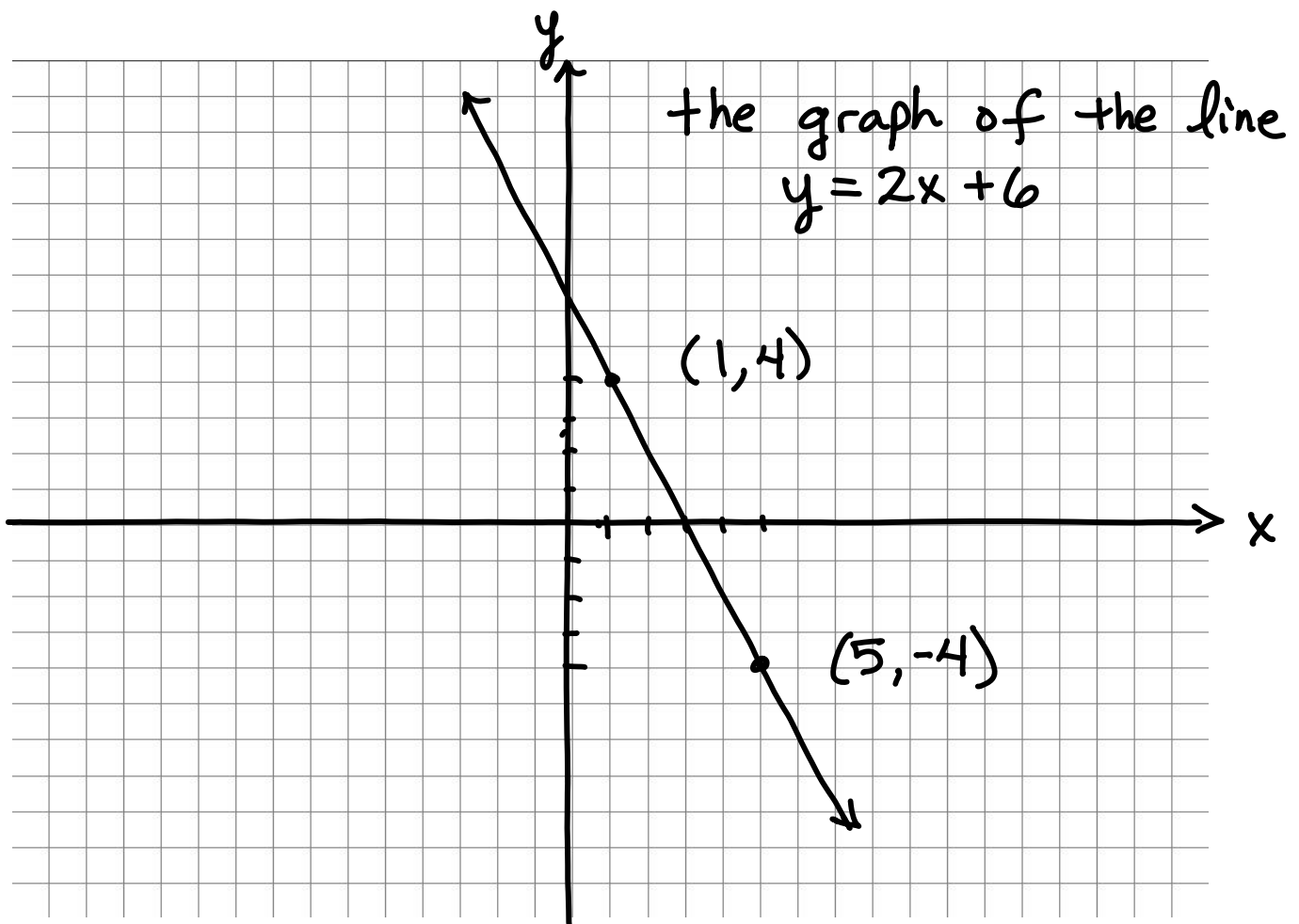
$$y + 10 = 6$$

$$y = -4$$

x	y
1	4
5	-4

the point  $(5, -4)$  is  
also on the line

plot the two points and draw the line



# Graphing lines using $y = mx + b$

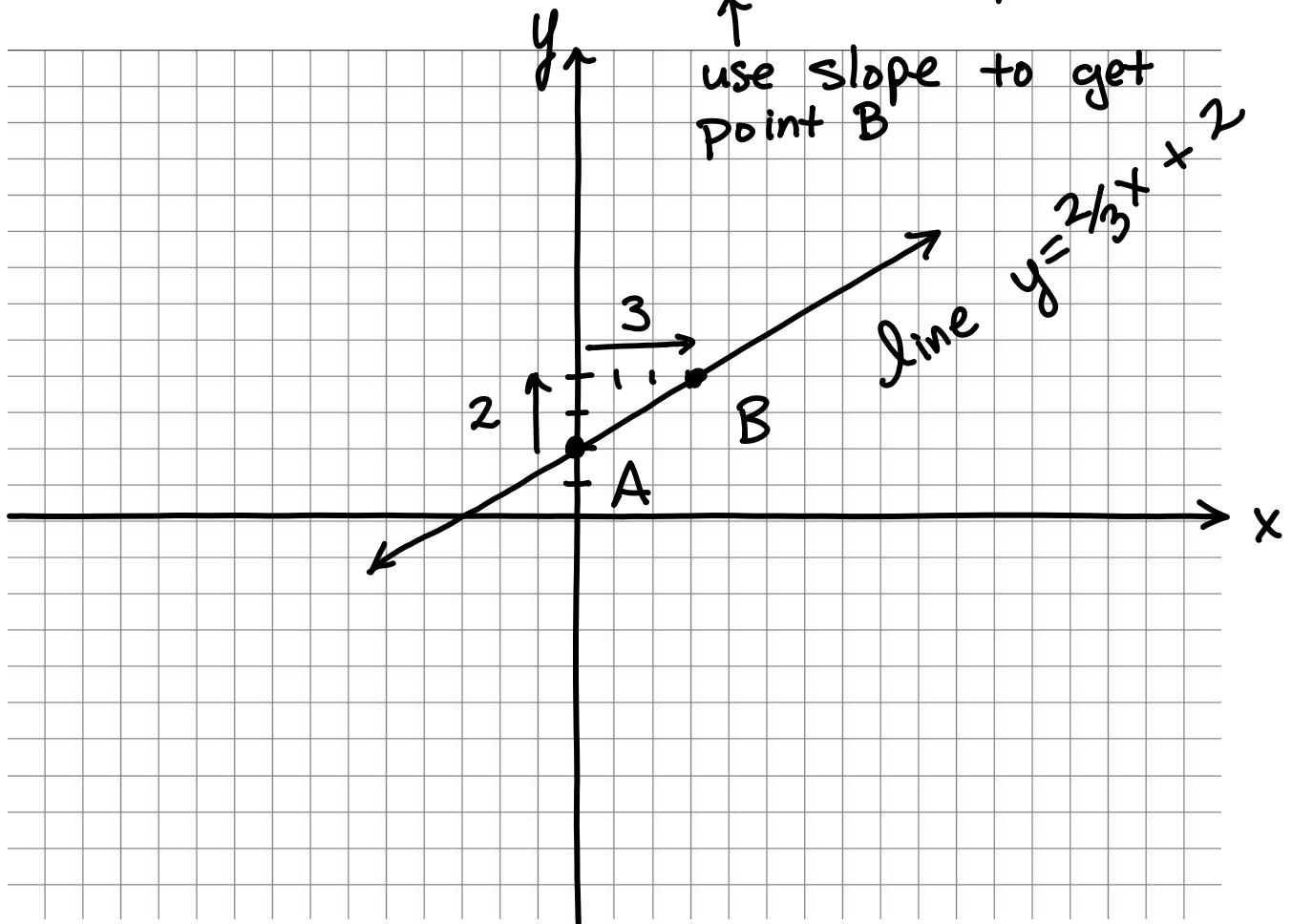
Next use the slope to find a second point on the line

↑  
first plot  $b$ , this is the  $y$ -intercept (one point on line)

## Graph $y = \frac{2}{3}x + 2$

↑ point A

↑ use slope to get point B



# Graphing lines using the XY-Intercepts

1. Plug in  $x=0$  and solve for  $y$  - this pair of points is the  $y$ -intercept,  $(0, y)$ .
2. Plug in  $y=0$  and solve for  $x$  - this pair of points is the  $x$ -intercept,  $(x, 0)$ .
3. Plot the points - draw the graph

Graph  $2x + 3y = -12$

x-intercept

$$2x + 3(0) = -12$$

$$2x = -12$$

$$x = -6$$

$$(-6, 0)$$

y-intercept

$$2(0) + 3y = -12$$

$$3y = -12$$

$$y = -4$$

$$(0, -4)$$

