

Feb 3/17

Name: $y = mx + b$ Date: _____

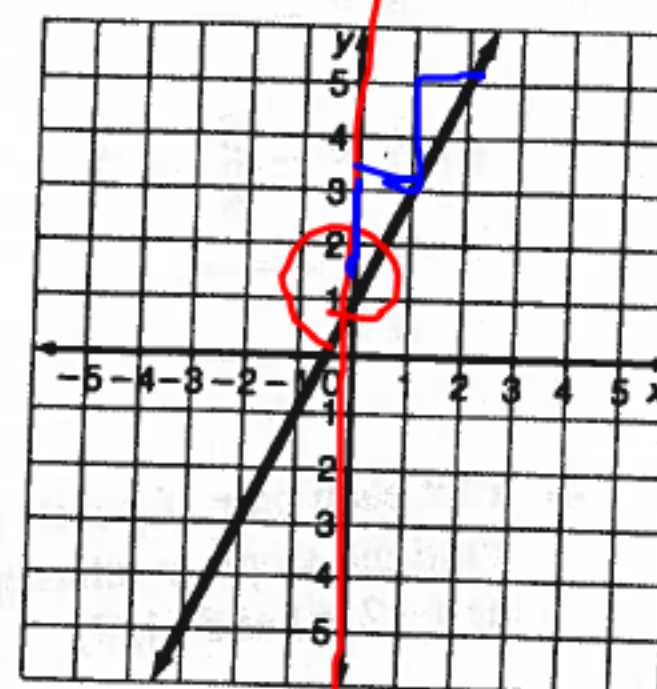
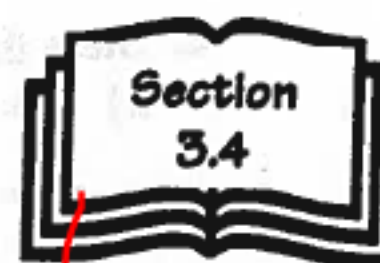
Practise: Interpreting Lines

1. a) For this line, the slope is +2 and the y-intercept is 1.
Therefore, the equation of the line is

$$y = 2x + 1$$

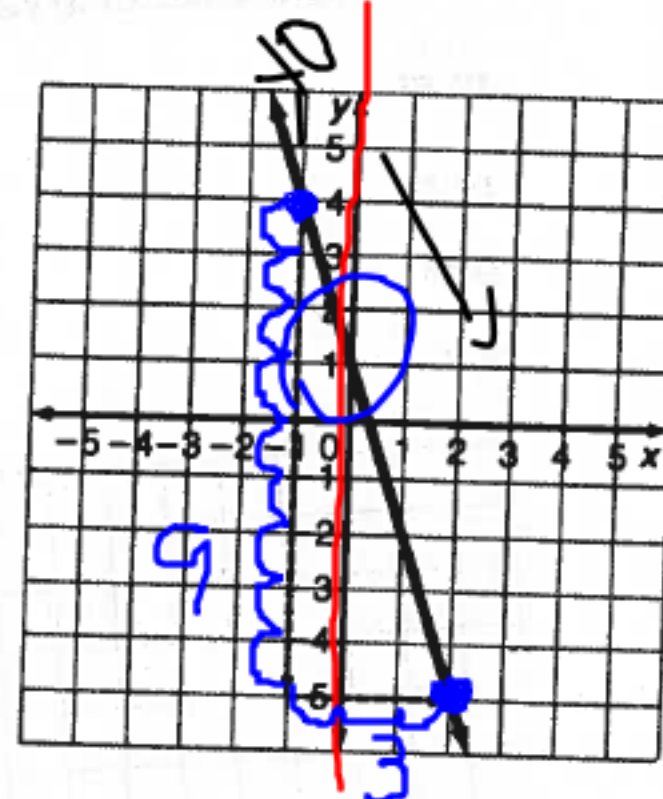
$$m = \frac{\text{rise}}{\text{run}}$$

$$b = y\text{-int}$$



- b) For this line, the change in y is -9 and the change in x is +3. The slope of the line is $\frac{-9}{3} = -3$.
The y-intercept is 1.

Therefore, the equation of the line is $y = -3x + 1$.



- c) For this line, the change in y is _____ and the change

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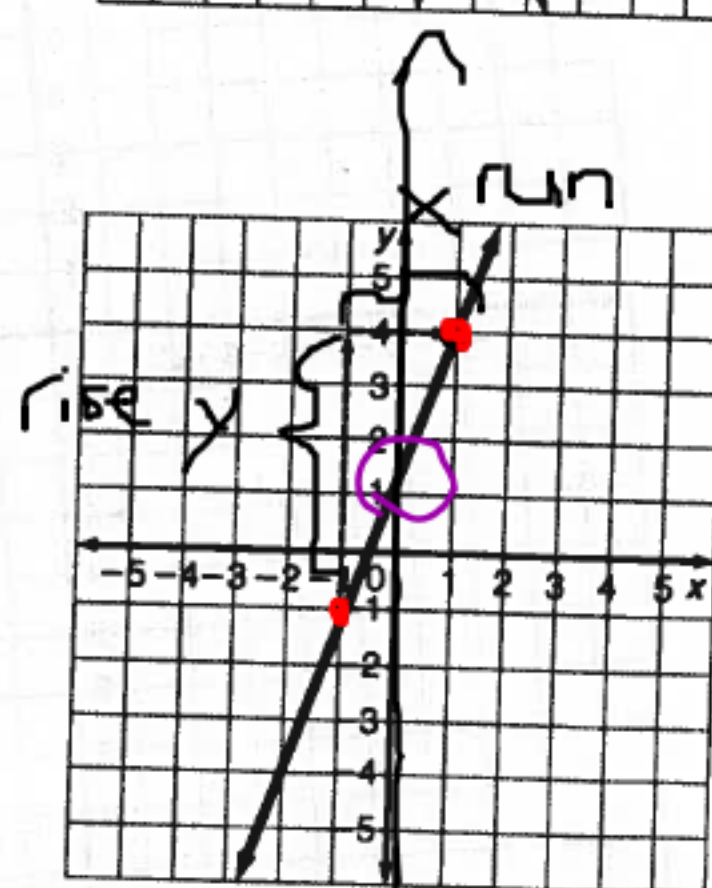
c) For this line, the change in y is 5 and the change in x is 2. The slope of the line is $\frac{5}{2} = \underline{\hspace{1cm}}$.

The y -intercept is 1.

Therefore, the equation of the line is

$$y = mx + b$$

$$y = \frac{5}{2}x + 1$$



continued

50 MHR • Chapter 3 Linear Functions

Name: _____

Date: _____

2. State the slope and y -intercept of the following lines.

a) $y = 3x - 7$

$m = \underline{\hspace{1cm}}$

$b = \underline{\hspace{1cm}}$

b) $y = -4x + 6$

$m = \underline{\hspace{1cm}}$

$b = \underline{\hspace{1cm}}$

c) $y = 2x$

$m = \underline{\hspace{1cm}}$

$b = \underline{\hspace{1cm}}$

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

$m = \underline{\hspace{1cm}}$

$b = \underline{\hspace{1cm}}$

e) $y = -x$

$m = \underline{\hspace{1cm}}$

$b = \underline{\hspace{1cm}}$

f) $y = 5$

$m = \underline{\hspace{1cm}}$



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Name: _____

$$y = \underline{m}x + \underline{b}$$

Date: _____

2. State the slope and y-intercept of the following lines.

a) $y = 3x - 7$

$$m = \underline{3}$$
$$b = \underline{-7}$$

b) $y = -4x + 6$

$$m = \underline{-4}$$
$$b = \underline{6}$$

c) $y = 2x$

$$m = \underline{2}$$
$$b = \underline{0}$$

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

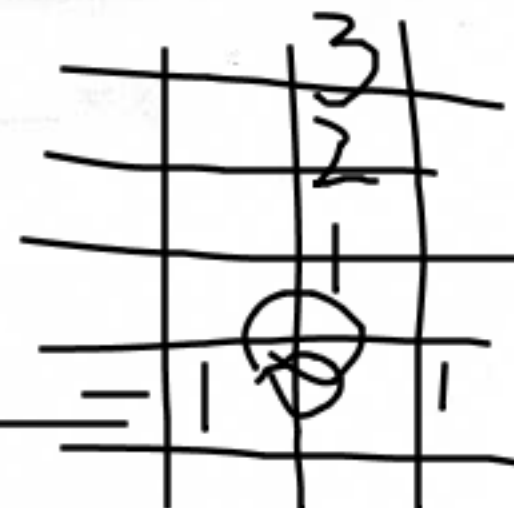
$$m = \underline{-\frac{3}{4}}$$
$$b = \underline{\frac{3}{4}}$$

e) $y = -x$

$$m = \underline{-1}$$
$$b = \underline{0}$$

f) $y = 5$

$$m = \underline{0}$$
$$b = \underline{5}$$

Section
3.4

3. Plot each pair of points on the grid below, then draw a line through the two points. Find the slope, y-intercept, and equation for each line.

a) $(-2, 6)$ and $(4, 9)$

$$m = \frac{\text{difference in y-values}}{\text{difference in x-values}}$$

$$m =$$

$$m =$$

$$b =$$

$$y =$$

b) $(-1, 4)$ and $(2, -5)$

$$m =$$

$$b =$$

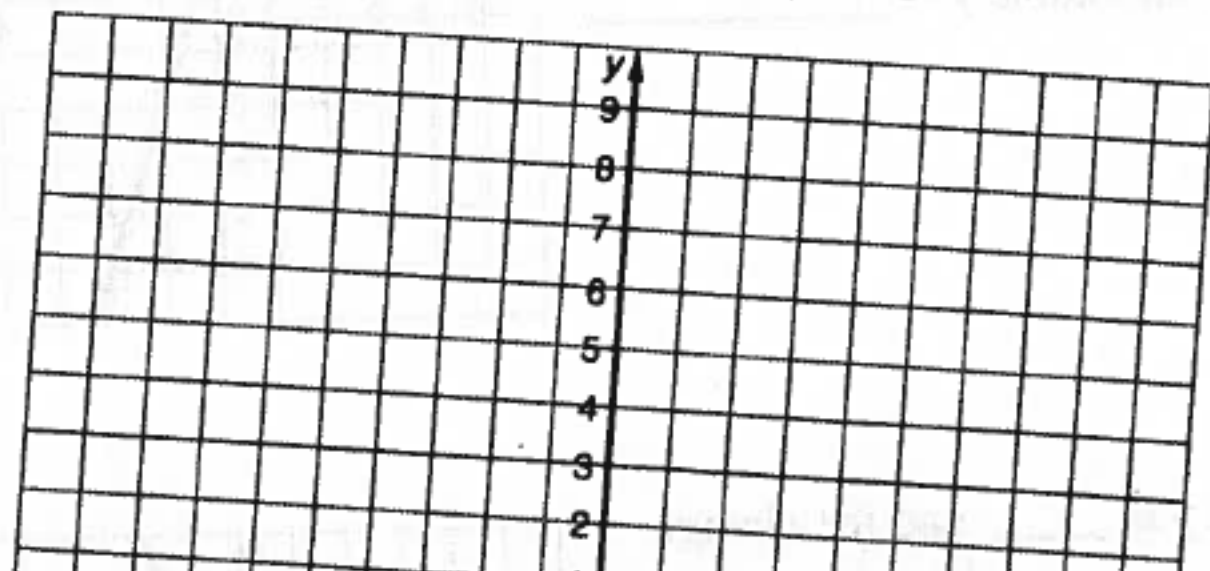
$$y =$$

c) $(-6, -8)$ and $(6, -5)$

$$m =$$

$$b =$$

$$y =$$



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

3. Plot each pair of points on the grid below, then draw a line through the two points. Find the slope, y-intercept, and equation for each line.

a) $(-2, 6)$ and $(4, 9)$

$$m = \frac{\text{difference in } y\text{-values}}{\text{difference in } x\text{-values}}$$

$$m =$$

$$m =$$

$$b =$$

$$y =$$

b) $(-1, 4)$ and $(2, -5)$

$$m =$$

$$b =$$

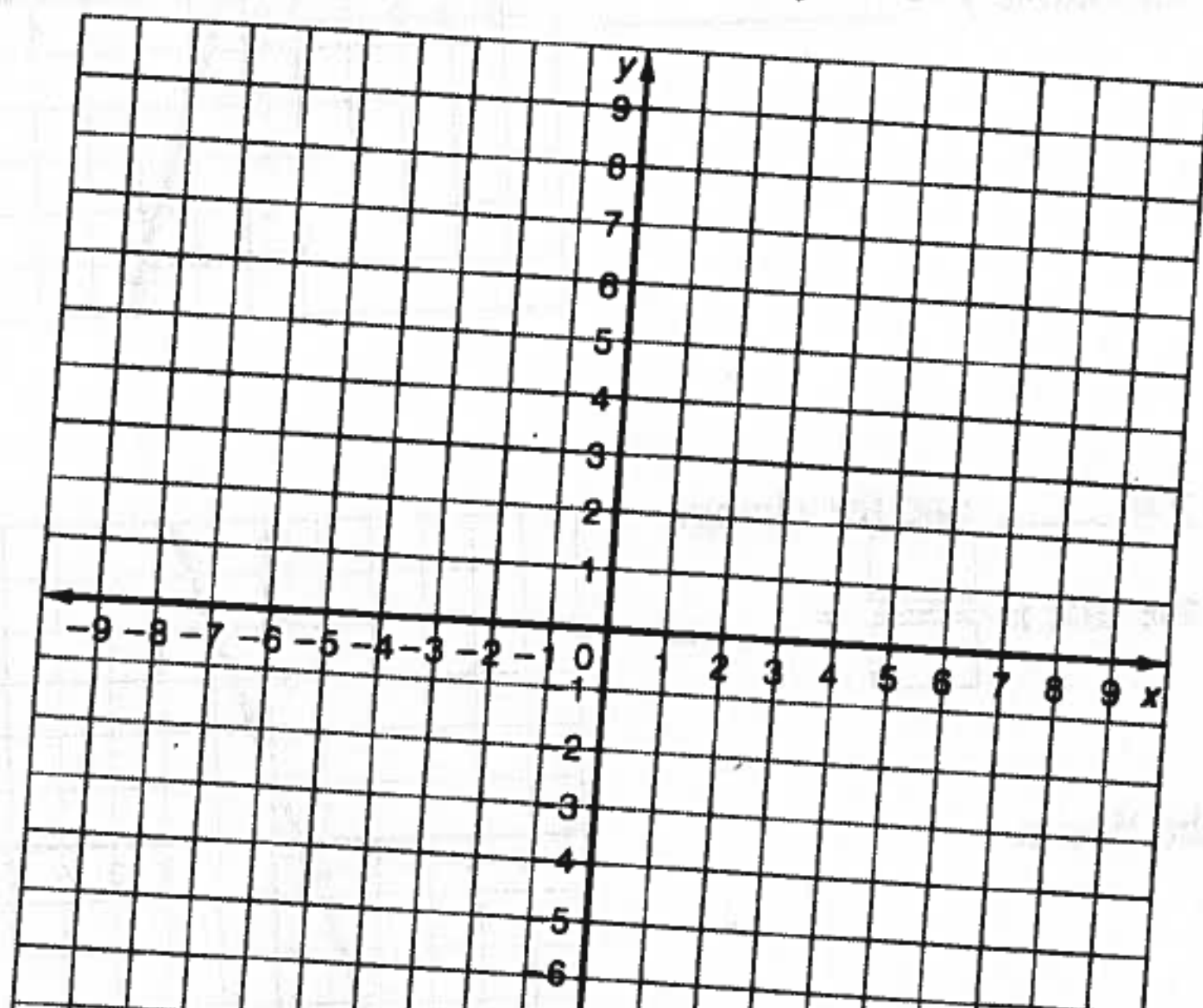
$$y =$$

c) $(-6, -8)$ and $(6, -5)$

$$m =$$

$$b =$$

$$y =$$



a) $(-2, 6)$ and $(4, 9)$ **Find the slope, y-intercept, and equation for each line.**

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

$$m = \frac{\text{difference in y-values}}{\text{difference in x-values}}$$

$$m = \frac{3}{6}$$

$$m = \frac{1}{2}$$

$$b = 7$$

$$y = \frac{1}{2}x + 7$$

b) $(-1, 4)$ and $(2, -5)$

$$m = -3$$

$$b = 1$$

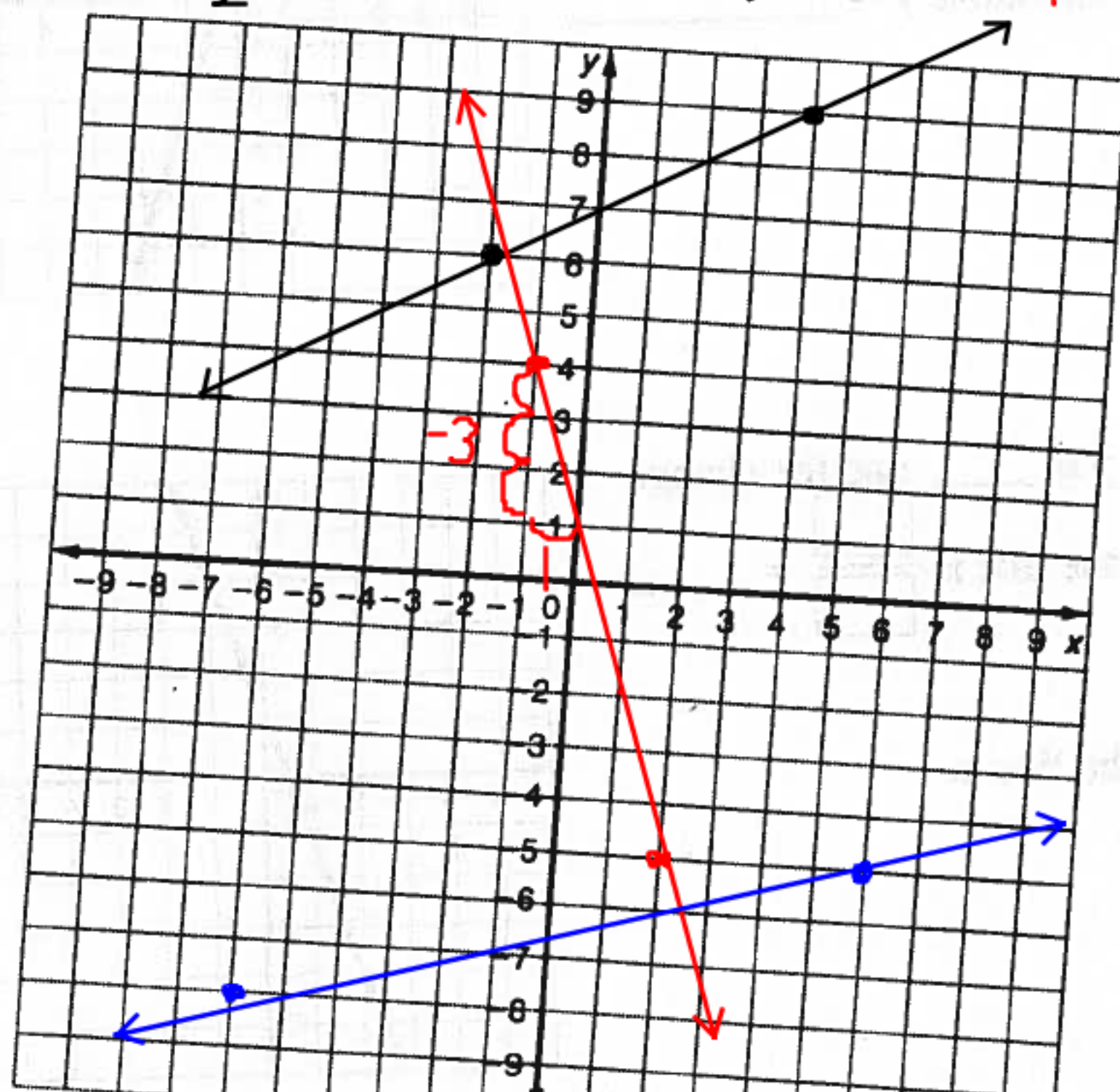
$$y = -3x + 1$$

c) $(-6, -8)$ and $(6, -5)$

$$m = \frac{1}{4}$$

$$b = -6.5$$

$$y = \frac{1}{4}x - 6.5$$



Writing the Equation of a Line

Method 1: When you know the y-intercept, use the Slope-Intercept Form, $y = mx + b$

1. Identify the **y-intercept (b)** and **slope (m)**
2. Write the equation replacing the b and m

~~Method 2:~~ When you have 2 points, neither which are the y-intercept, you can use Slope-Point form

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

- ~~1. Use the 2 points to **calculate** the slope (**m**)
 2. Sub in **m** and a **point for (x₁, y₁)** into the Slope-point form
 3. Reorder the equation into Slope-Intercept form OR Standard form~~

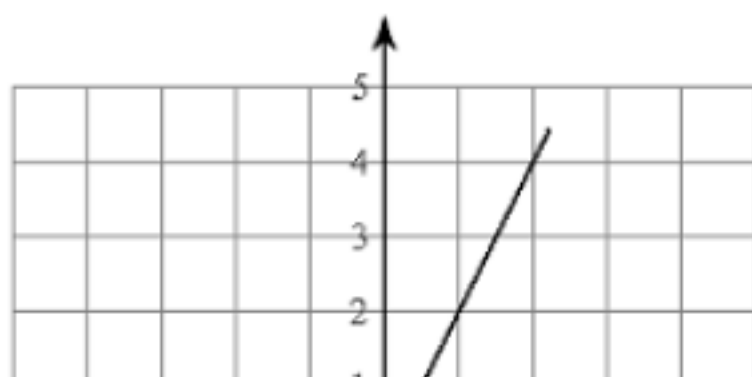
Method 3: When you have 2 points, neither which are the y-intercept, you can use Slope-Intercept Form, $y = mx + b$

1. Use the 2 points to **calculate** the slope (**m**)
2. Sub in **m** and a **point for (x, y)**
3. Solve for b
4. Write the equation replacing the b and m

Examples:

$$y = mx + b$$

$$y = -3x - 5$$

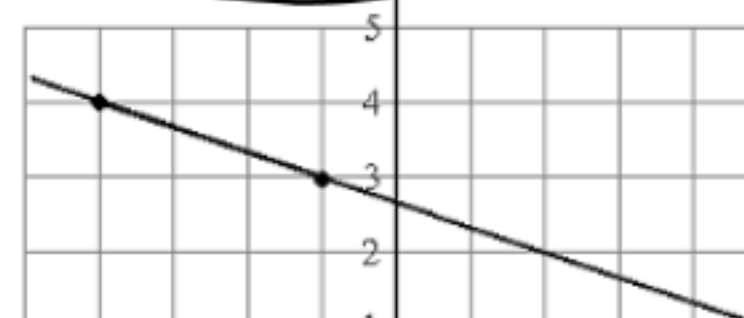


$$y = mx + b$$

$$-6 = -3(-2) + b$$

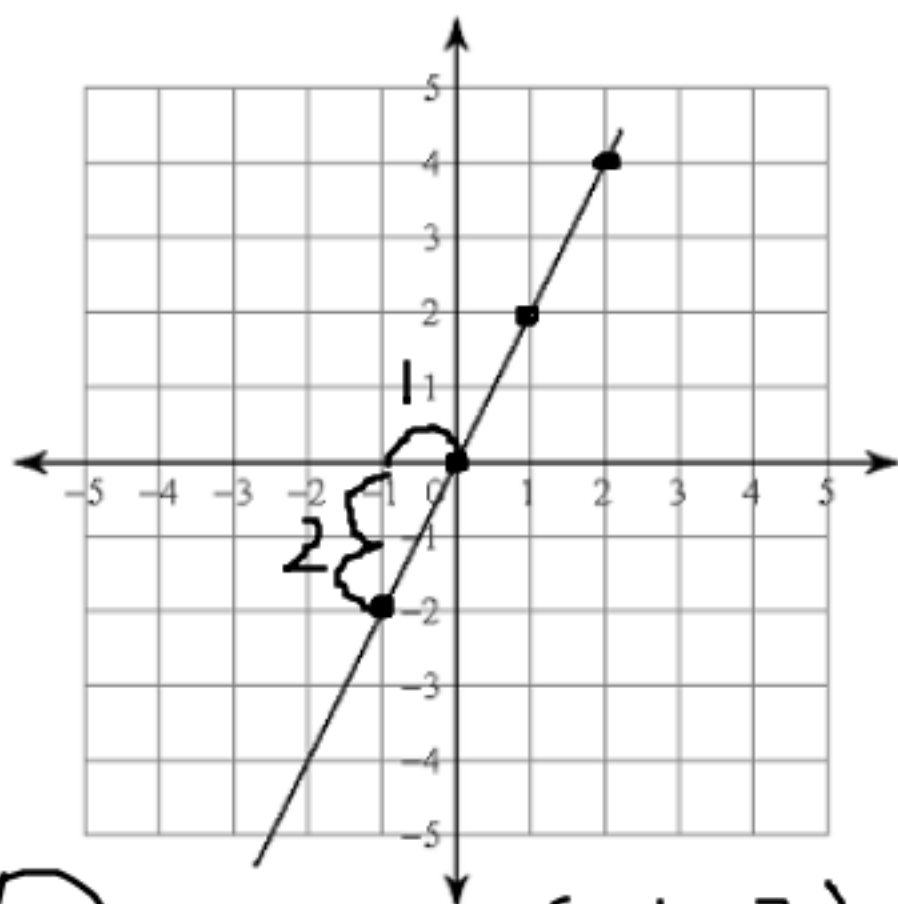
$$-6 = 6 + b$$

$$-12 = b$$



$$\begin{array}{c} x \quad y \\ (-2, 1) \\ m = -3 \end{array}$$

Examples:



$$b = 0$$

$$m = \frac{2}{1}$$

$$y = 2x + 0$$

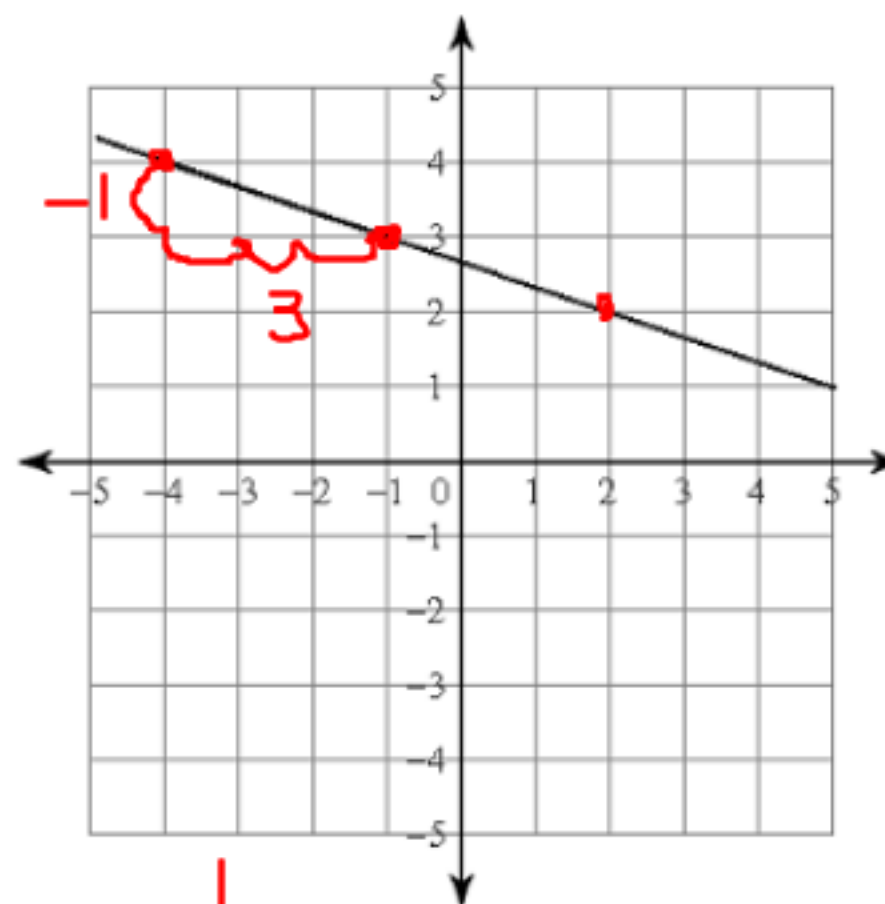
$$(-1, -2) \quad (0, 0)$$

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

$$m = \frac{0 - (-2)}{0 - (-1)}$$

$$m = \frac{2}{1}$$

$$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 \\ 2 \end{pmatrix}$$



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

$$y = mx + b$$

$$\frac{2}{2} = -\frac{1}{3} \left(\frac{2}{1} \right) + b$$

$$= -\frac{2}{3} + b$$

$$3 \times \frac{2}{3} + \frac{2 \times 1}{3} = b$$

$$\frac{6}{3} + \frac{2}{3} = b$$

$$\frac{8}{3} = b$$