

How do we graph a line in Slope-Intercept form?

- A number that describes the **steepness** of a line is called the slope of the line.
- The y-intercept is the **y-coordinate** of the point where a line crosses the **y-axis**. For example, when a line crosses the y-axis at $(0,3)$, the y-intercept is 3.

the x-value is always 0 *only give when they ask for a coordinate* *always just a # (constant)*

Slope-Intercept Form **coordinate**

An equation written in the form $y = mx + b$ is in slope-intercept form.

The graph is a line with slope m and y-intercept b .

↑ *↑*
coeff of x *constant*

Example: In the equation $y = \frac{2}{3}x - 1$, the value $\frac{2}{3}$ is the **slope** of the line. The value -1 is the **y-intercept** of the line.

1) Identify the slope and y-intercept of each equation.

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

slope = $-\frac{3}{4}$
y-intercept = 2

(b) $y = 2x - 3$

slope = 2
y-intercept = -3

(c) $y = x - 4$

slope = 1
y-intercept = -4

(d) $y = \frac{1}{2}x + 0$

slope = $\frac{1}{2}$
y-intercept = 0

(e) $y = -x + 0$

slope = -1
y-intercept = 0

y = mx + b

(f) $3x + y = 10$

$-3x$ $-3x$
 $\rightarrow y = -3x + 10$

slope = -3
y-intercept = 10

(g) $\frac{4y}{4} = \frac{8x+4}{4} \rightarrow y = 2x + 1$

slope = 2
y-intercept = 1

(h) $4x - 2y = 10$

$-4x$ $-4x$
 $-2y = -4x + 10$
 -2 -2 -2
slope = 2
y-intercept = -5

y = 2x - 5

(i) $7x - y = -4$

$-7x$ $-7x$
 $-y = -7x - 4$
 4 -1 -1
slope = 7
y-intercept = 4

y = 7x + 4

$$y = mx + b$$

↑ slope
↑ y-int

2) Create an equation given the slope and y-intercept

(a) Slope = -6 , y-intercept = 5

$$y = -6x + 5$$

(b) Slope = $\frac{1}{2}$, y-intercept = -3

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

(c) Slope = -4 , y-intercept = 0

$$y = -4x$$

(d) Slope = 0 , y-intercept = 6

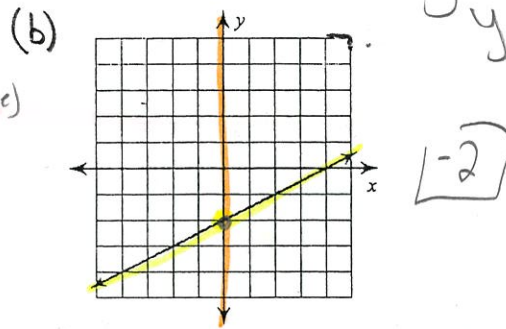
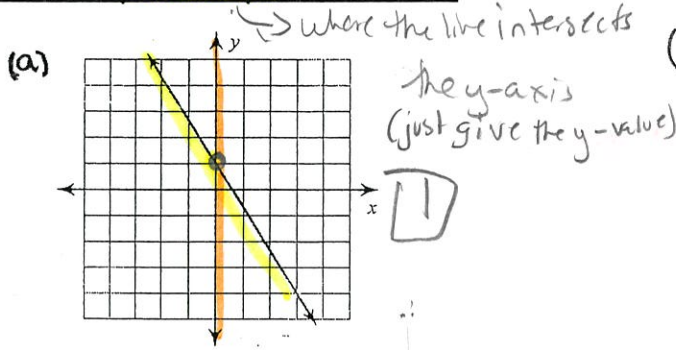
$$y = 6$$

$$y = 0x + 6$$

$$y = 0 + 6$$

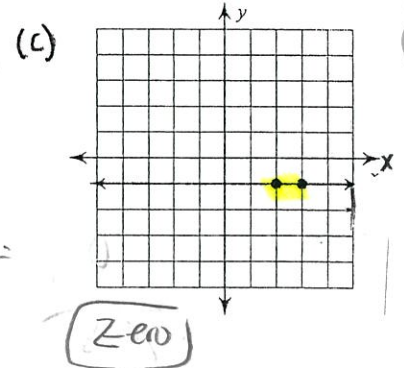
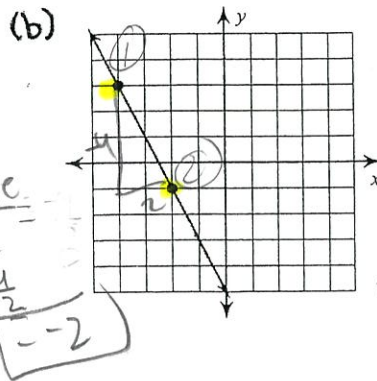
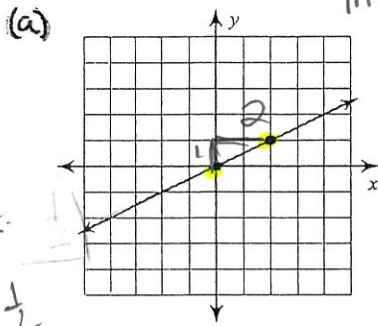
$$y = 6$$

3) Find the y-intercept for each line

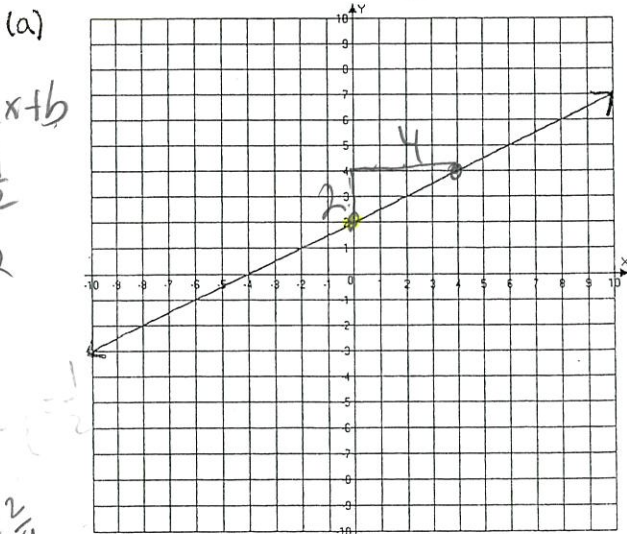


4) Find the slope of each line

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



5) Write the equation of each line.

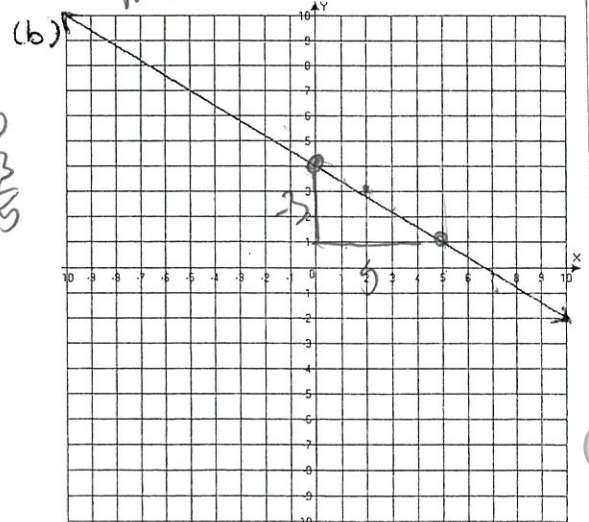


$$y = mx + b$$

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

$$b = 2$$

Answer: $y = \frac{1}{2}x + 2$



$$y = mx + b$$

$$m = -\frac{3}{5}$$

$$b = 4$$

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

$$m = -\frac{3}{5}$$

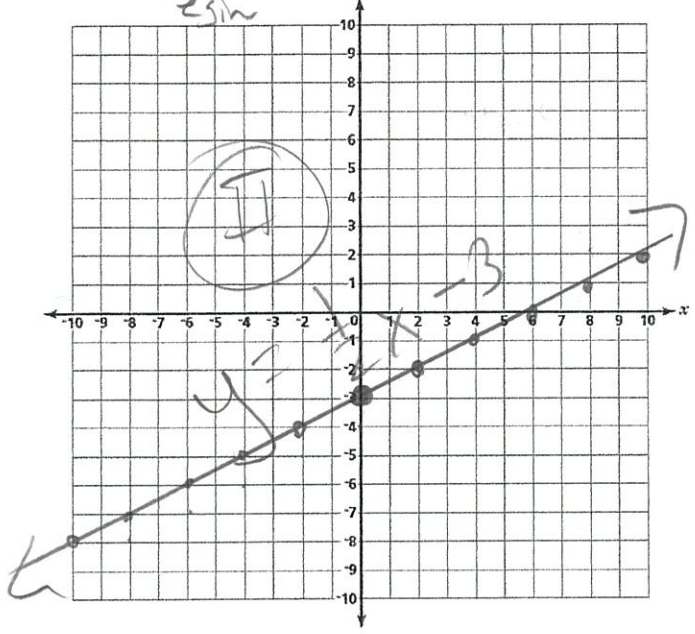
Answer: $y = -\frac{3}{5}x + 4$

6) Graph each equation using the slope-intercept method.

$y = mx + b$
 (slope) m \downarrow begin (y-int).
 m : positive \nearrow Negative \searrow

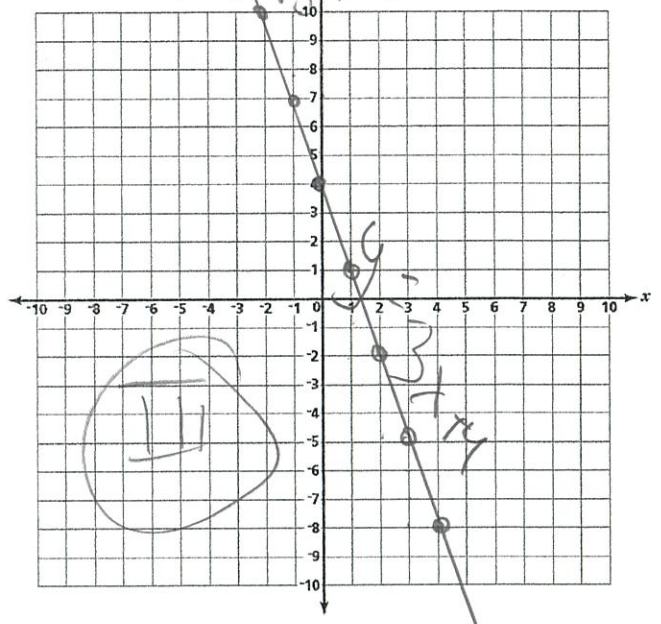
(a) $y = \frac{1}{2}x - 3$

$m = \frac{1}{2}$
 $b = -3$ (y-int)



(b) $y = -3x + 4$

$m = -3$
 $b = 4$ (y-int)

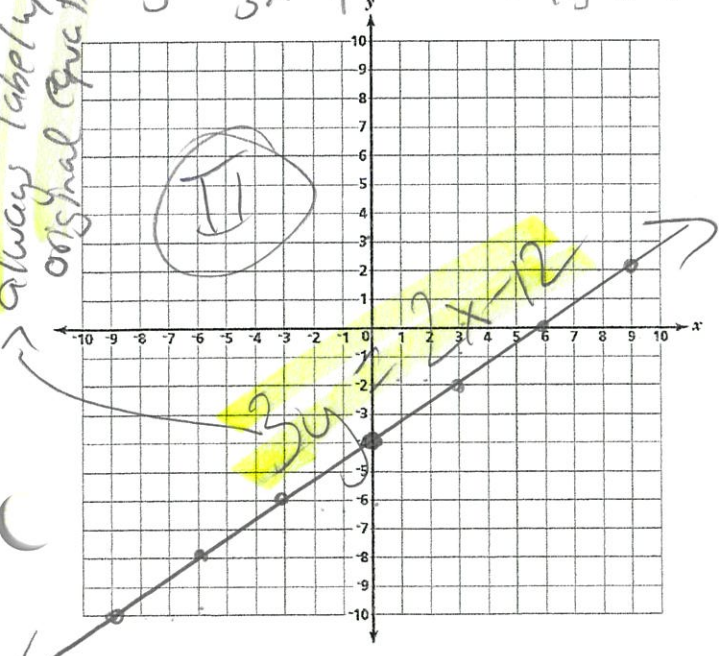


(c) $3y = 2x - 12$

$m = \frac{2}{3}$
 $b = -4$ (y-int)

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

Always label original equation

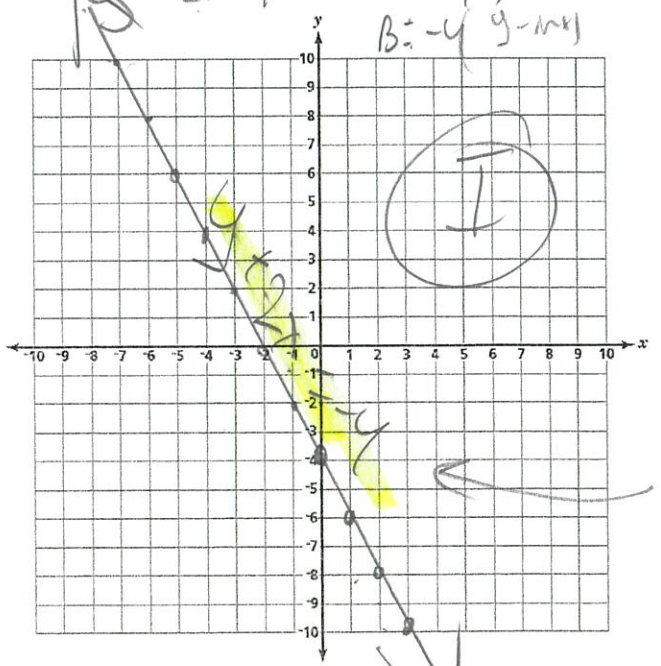


(d) $y + 2x = -4$

$m = -2$
 $b = -4$ (y-int)

$y = -2x - 4$

Always label original equation



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