Name Keys
Date

# Equation of a line

- 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.

## Slope-Intercept Form

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

The graph is a line with slope $m$ (coefficient) and y-intercept $b$ (constant).

Example: In the equation $y = \frac{2}{3}x - 1$, the value 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

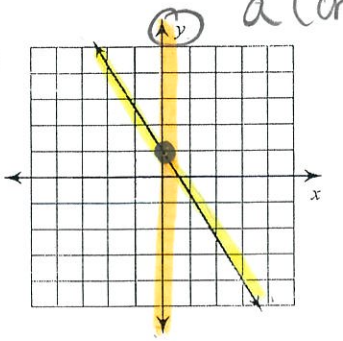
y-intercept = 0

3) Find the **y-intercept** for each line.

→ where the line intersects the y-axis

↓ a Constant (the y-value)

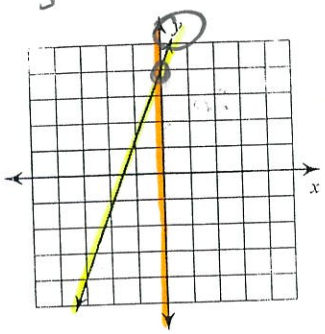
(a)



$b = 1$

Coordinate: $b = (0, 1)$

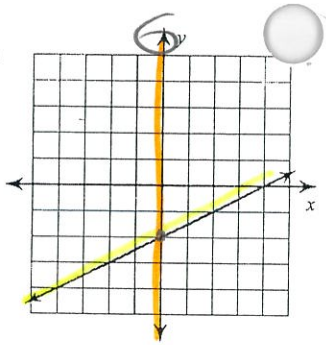
(b)



$b = 4$

Coordinate $b = (0, 4)$

(c)

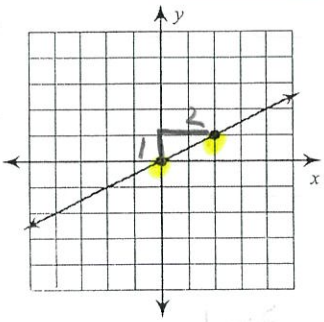


$b = -2$

Coordinate $b = (0, -2)$

4) Find the **slope** of each line.

(a)



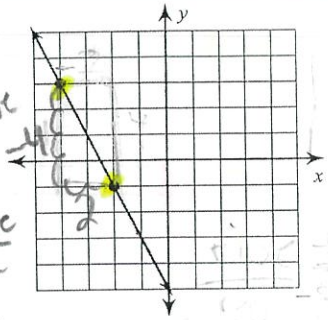
Positive

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

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

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

(b)



Negative

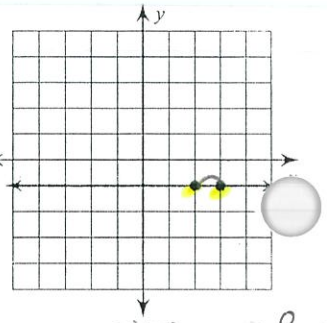
$m = \frac{rise}{run}$

$m = \frac{-4}{2}$

$m = -2$

$m = -2$

(c)



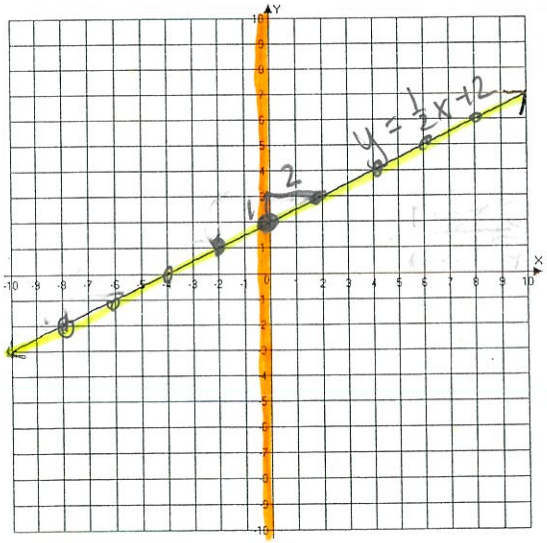
zero

$m = \frac{rise}{run}$ $m = \frac{0}{1}$ $m = 0$

$m = 0$

5) Write the **equation** of each line.

(a)



$y = mx + b$

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

$b = 2$

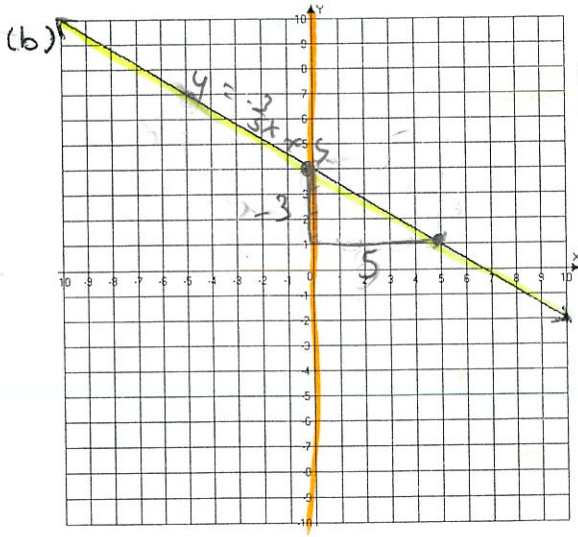
positive

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

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

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

(b)



$y = mx + b$

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

$b = 4$

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

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

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