

Equations of a Line

How do you write an

EQUATION of a LINE

in

SLOPE INTERCEPT FORM?

$$Y = m \times + b$$

$m = \text{slope}$

$b = \text{y-intercept}$

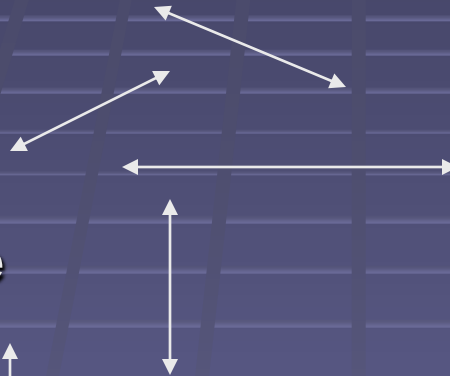
Vocabulary

- **Slope**

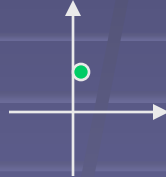
Rise

Run

- **Negative slope**
- **Positive slope**
- **No slope**
- **Undefined slope**



- **y – intercept**



- **Slope-intercept format**

$$y = mx + b$$

- **Point –slope format**

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

Ordered Pair

$$(x_1, y_1) \quad (x_2, y_2)$$

How do you write the equation of a line when given the slope and the y-intercept?

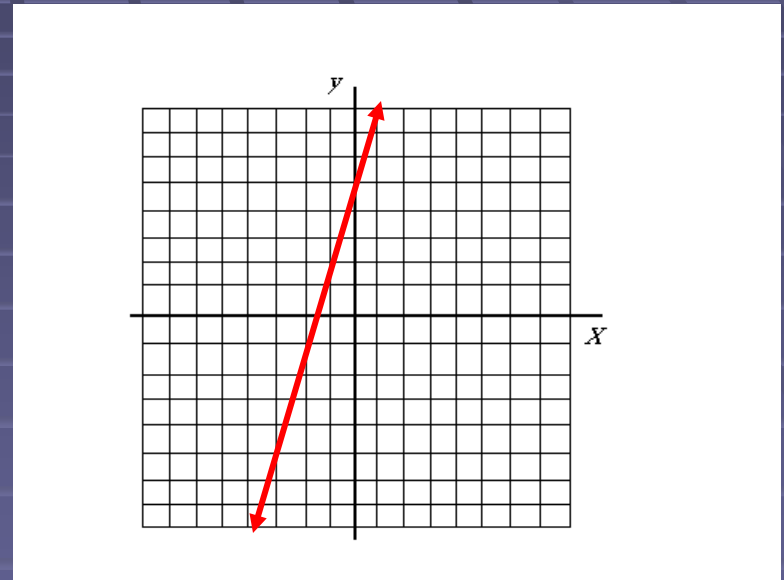
$m = 3$ Y-intercept

$(0, 4)$

$y = m \times x + b$

so

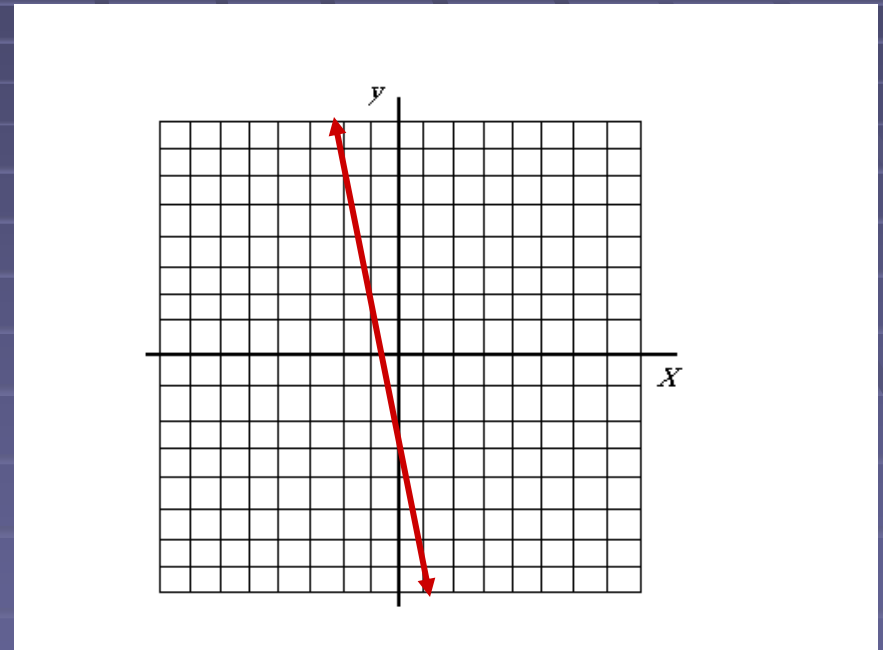
$y = 3x + 4$



How do you write the equation of a line when given the slope and the y-intercept?

$m = -5$ Y-intercept

$(0, -3)$



$y = m \times + b$

so

$y = -5x - 3$

How do you write the equation of a line when given the slope and the y-intercept?

$m = 1$

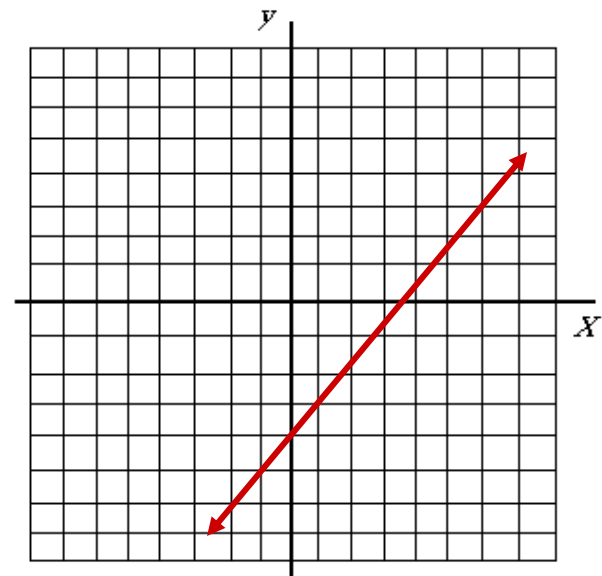
Y-intercept

$(0, -4)$

$y = m \times + b$

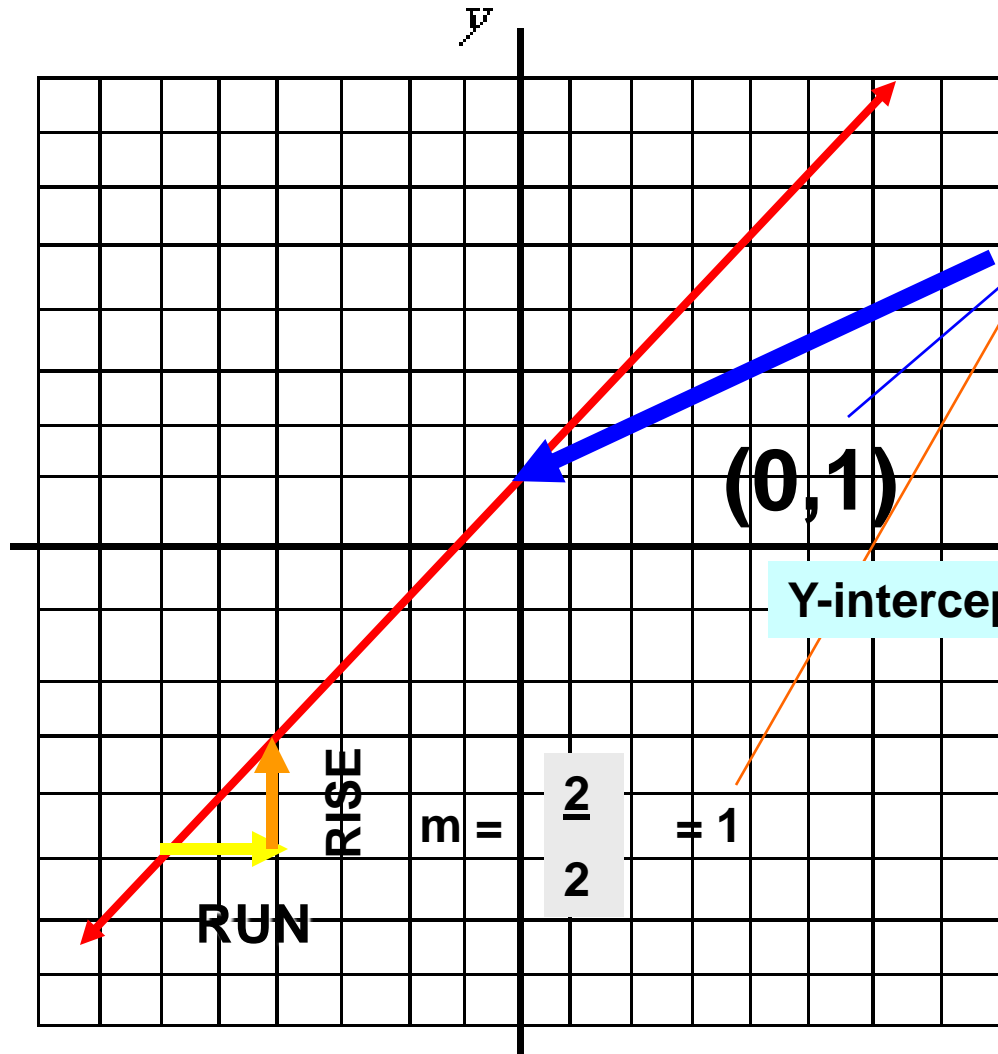
so

$y = x - 4$



How do we write the equation of this line?

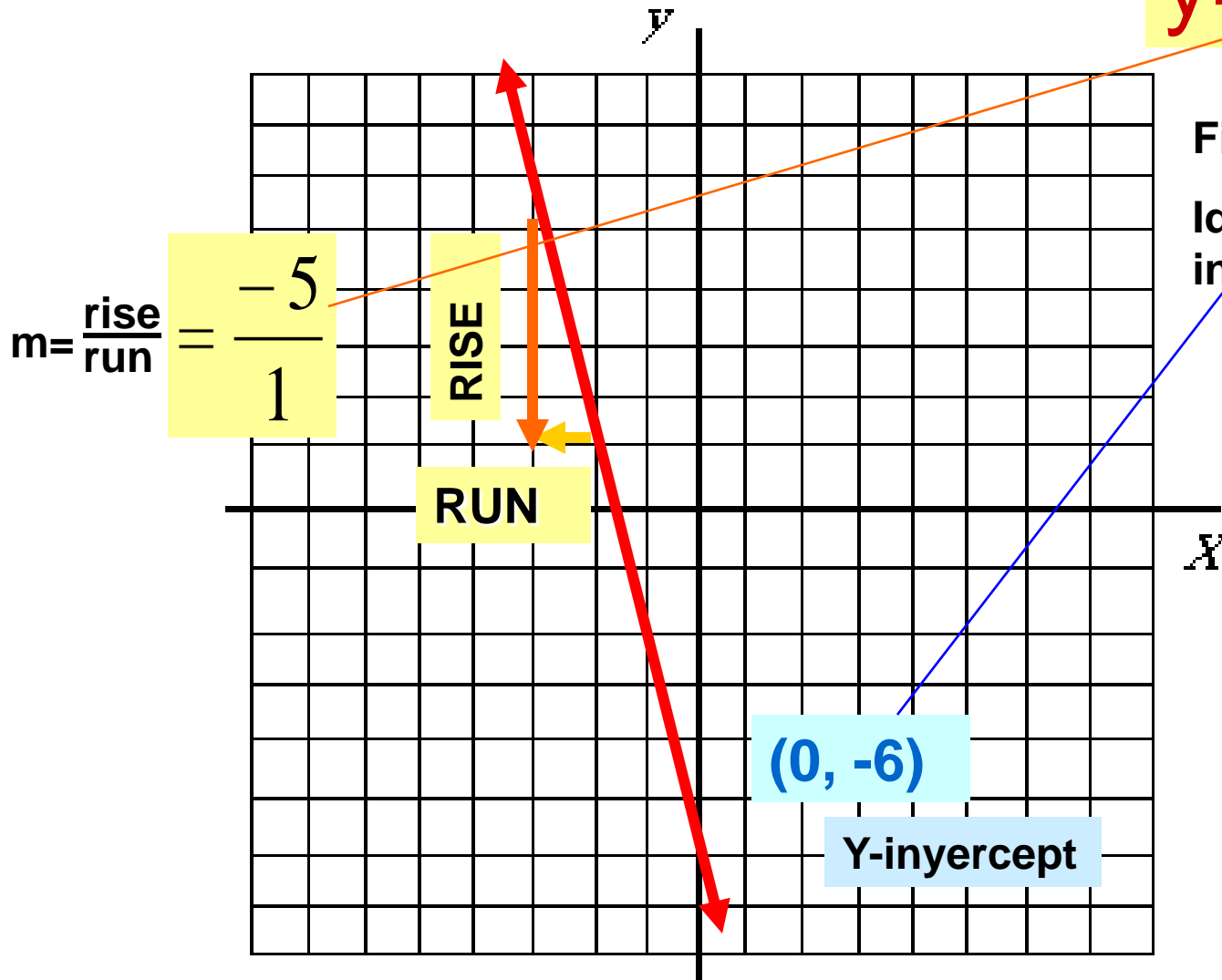
$$Y = X + 1$$



First:
Identify the y-intercept

Second:
Determine the slope by counting the
Rise
Run

How do we write the equation of this line?



$$y = -5x - 6$$

First:
Identify the y-intercept

Second:
Determine the slope by counting the
Rise
Run

How do you write the equation of a line when given two points on the line?

Given points:

(4,5) and (-2,3)

(x_1, y_1)

(x_2, y_2)

$$Y = mx + b$$
$$M = \frac{1}{3} \quad (4,5)$$

$$5 = 1 \cdot 4 + b$$

$$5 = 4 + b$$

$$5 - 4 = 4 - 4 + b$$

$$1 = b$$

$$y = \frac{1}{3}x + 1$$

Use point-slope format:

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

$$m = \frac{3 - 5}{-2 - 4} = \frac{-2}{-6} = \frac{1}{3}$$

How do you write the equation of a line when given two points on the line?

Given points:

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

(x_1, y_1)

(x_2, y_2)

$$Y = mx + b$$

$$M = -2$$

$$(4, -6)$$

$$Y = m x + b$$

$$-6 = -2(4) + b$$

$$-6 = -8 + b$$

$$-6 + 8 = -8 + 8 + b$$

$$2 = b$$

$$y = -2x + 2$$

Use point-slope format:

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-6 - 6}{4 - (-2)} = \frac{-12}{6} = -2$$