

Lesson 3.2:
Slope
&
Equations of
Lines

Standard Form

$$Ax + By = C$$

But we like to have y by itself- it makes it easier to graph. So we solve for y .

Lesson 3.2: Slope and Equations of Lines

Example 1: Solve for y

$$3x + 4y = 20$$

This is called

Slope - Intercept Form

$$y = f(x) = mx + b$$

Slope

y - intercept

Lesson 3.2: Slope and Equations of Lines

Slope is $\frac{\text{Rise}}{\text{Run}}$

Rise:

- ~If rise is Positive,
we go UP.
- ~If rise is Negative,
we go DOWN.

Run:

- ~If run is Positive,
we go RIGHT.
- ~If run is Negative,
we go LEFT.

Lesson 3.2: Slope and Equations of Lines

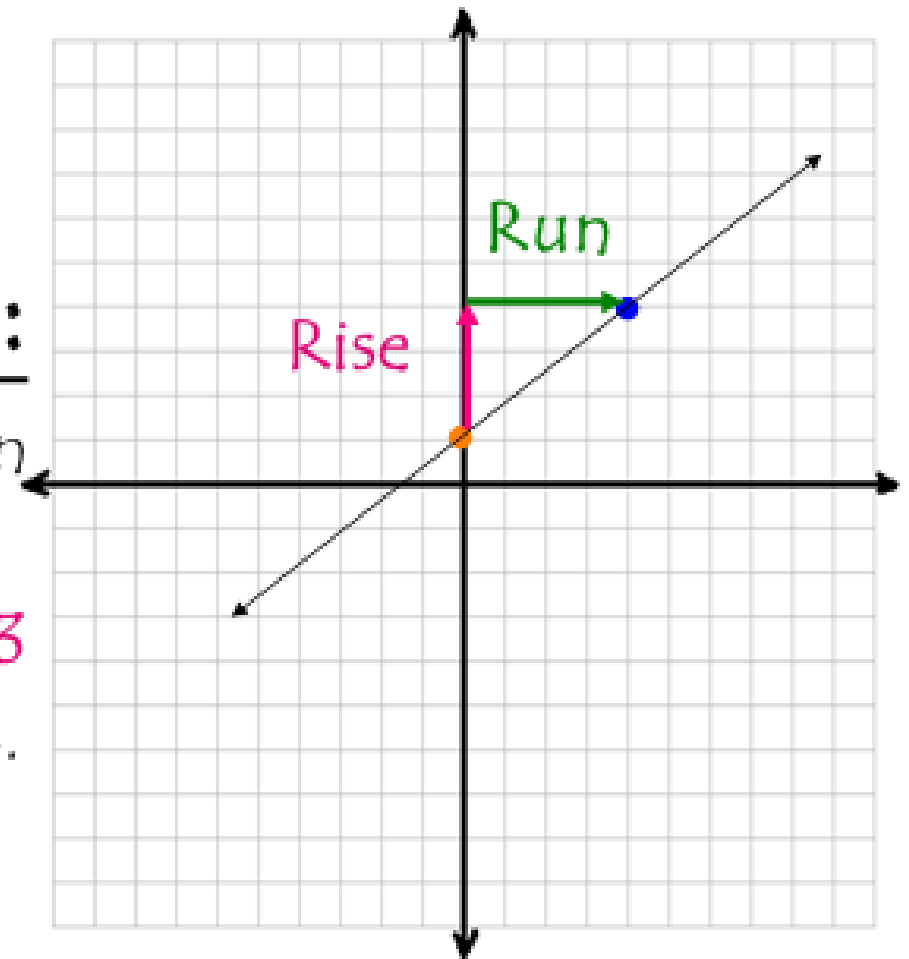
Remember:

Slope is $\frac{\text{Rise}}{\text{Run}}$

If: $y = \frac{3}{4}x + 1$ Then:

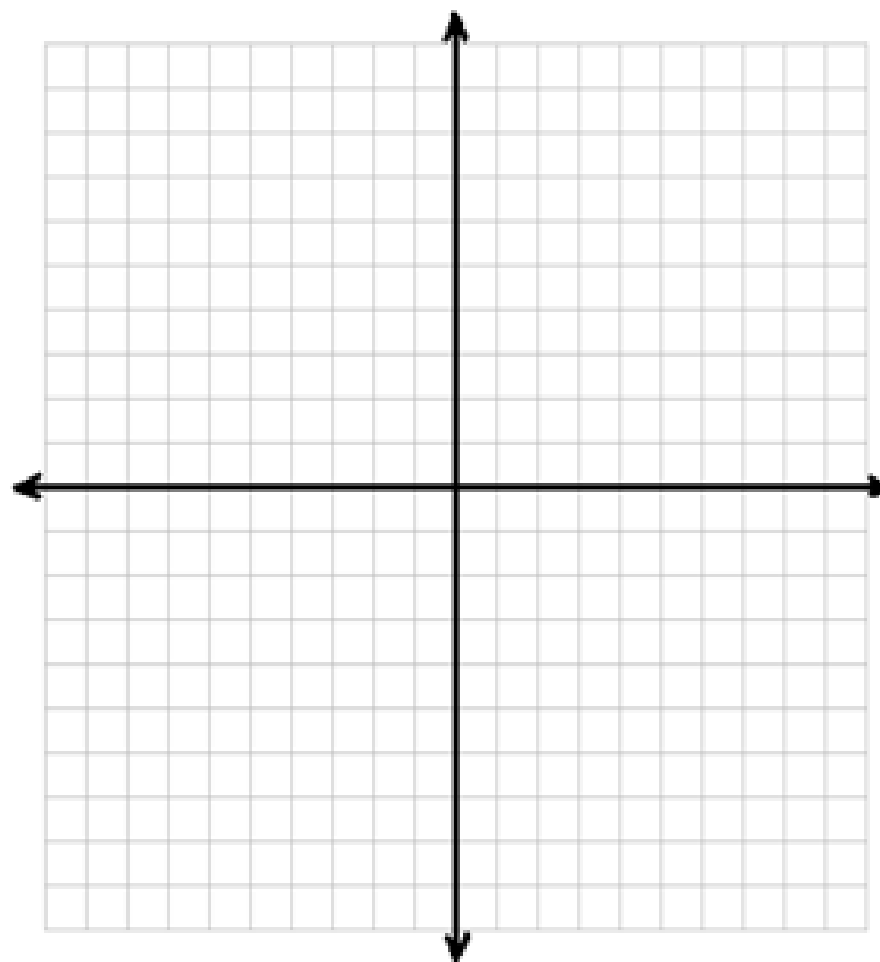
$$m = \frac{3}{4} \quad b = 1$$

Start at 1 on the y-axis and go up 3 and right 4.



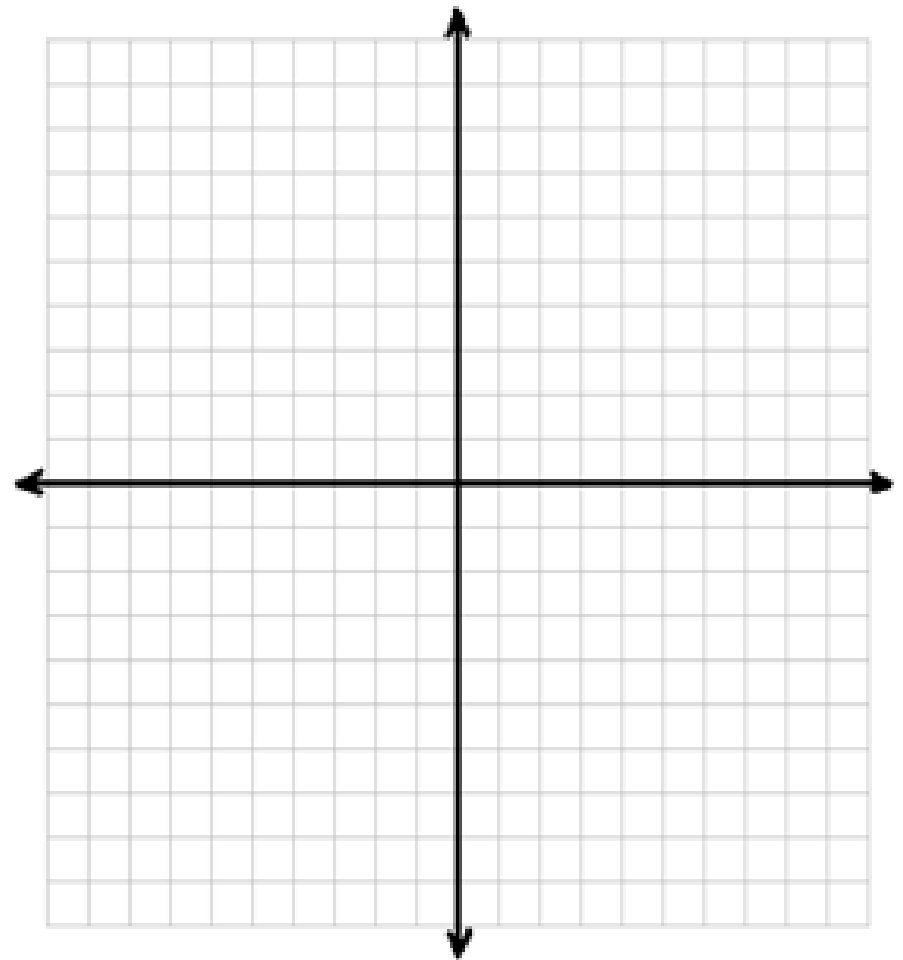
Lesson 3.2: Slope and Equations of Lines

Example 2: $y = \frac{-2}{3}x + 2$



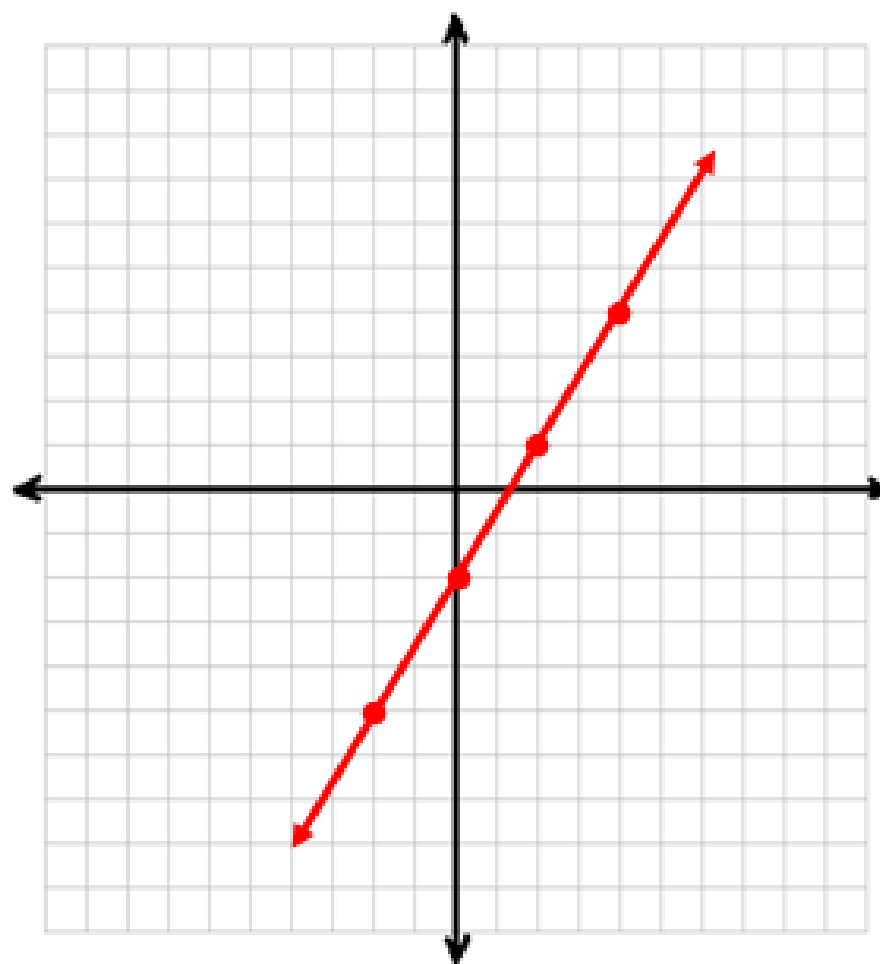
Lesson 3.2: Slope and Equations of Lines

Example 3: $3x + 2y = -4$



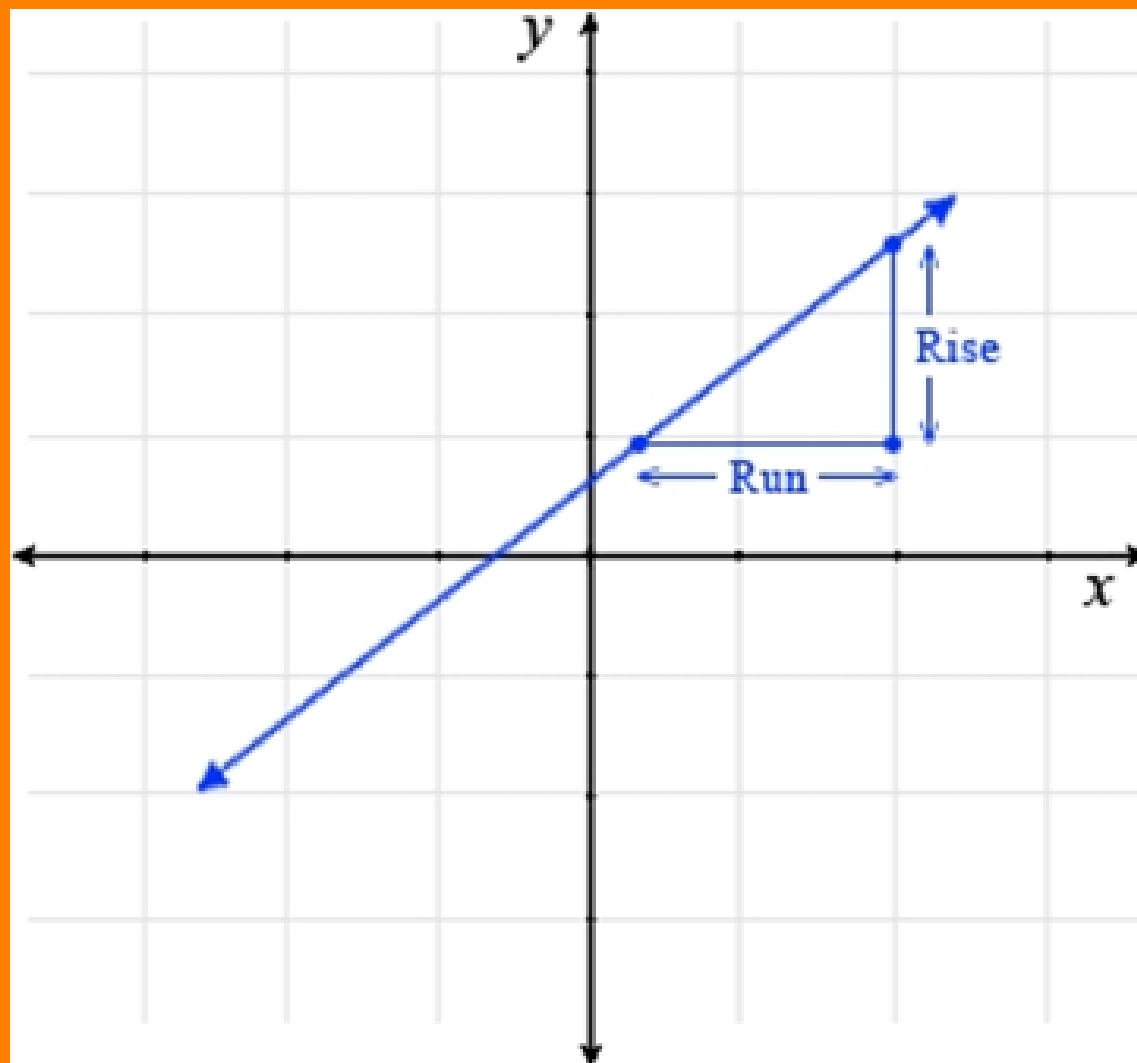
Lesson 3.2: Slope and Equations of Lines

Example 4: Write the Equation of the line in the graph. (Hint: Identify the slope and the y -intercept.)



Slope!

Rise
Run

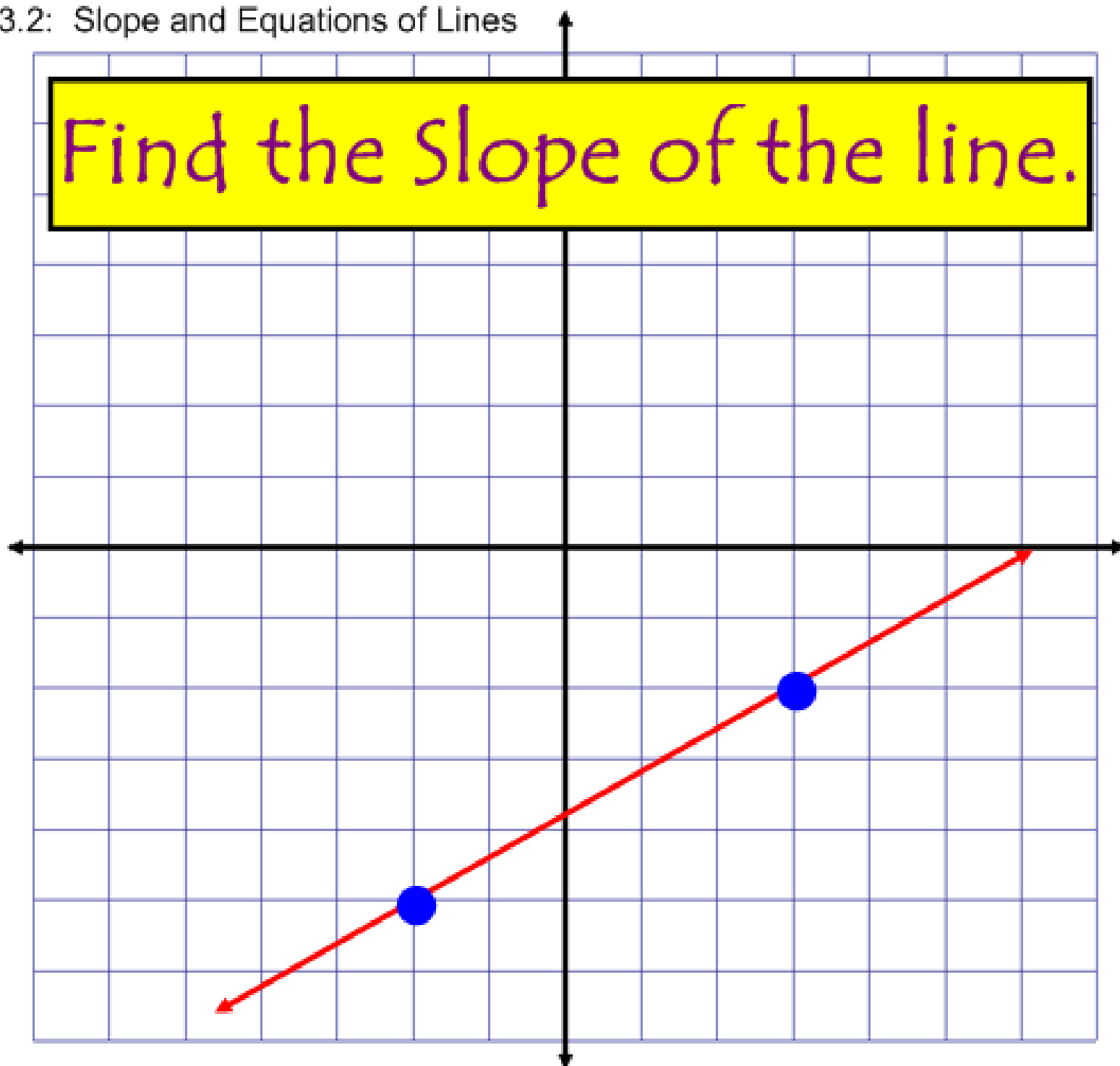


Slope = m

$$m = \frac{\text{Rise}}{\text{Run}}$$

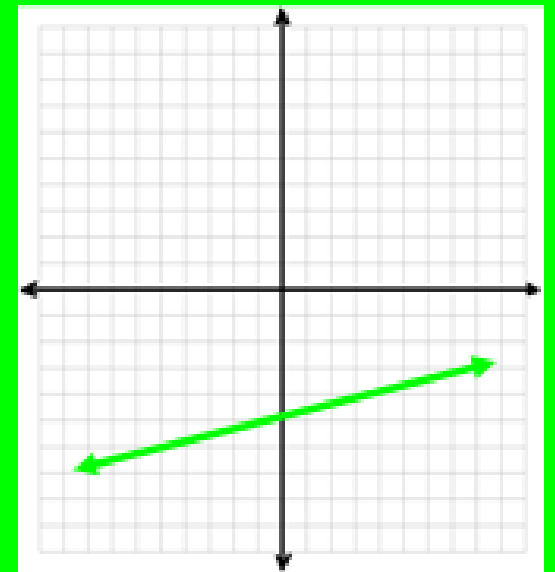
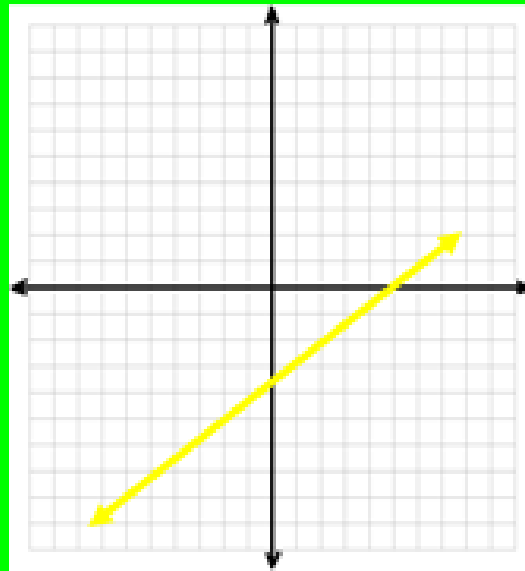
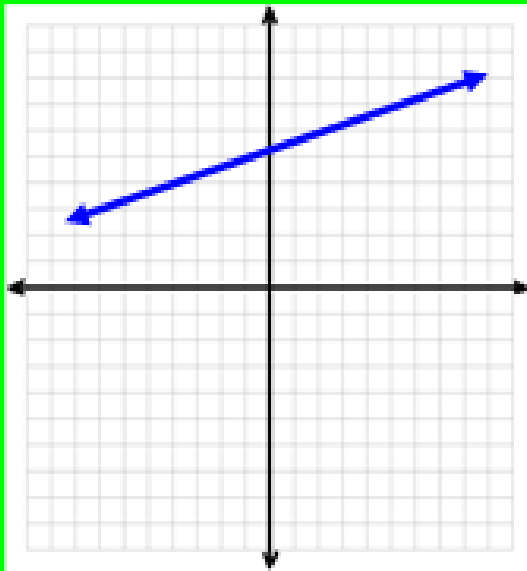
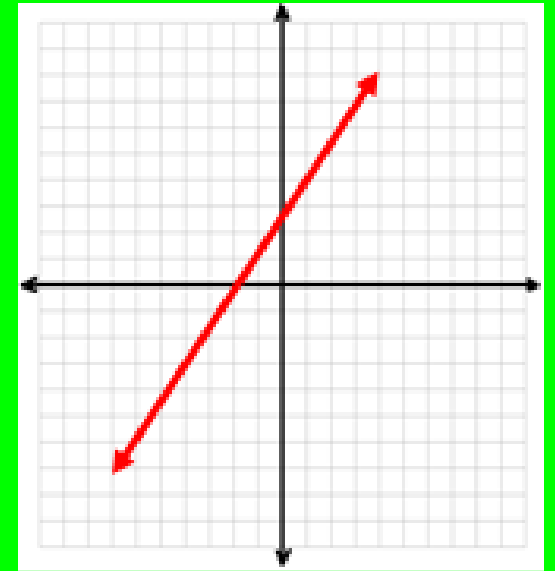
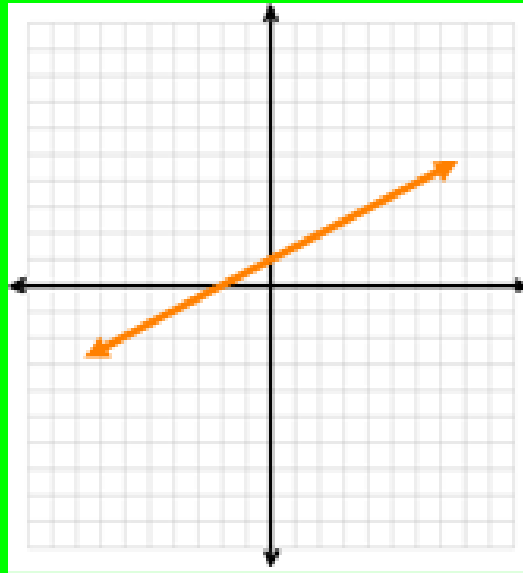
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Find the Slope of the line.



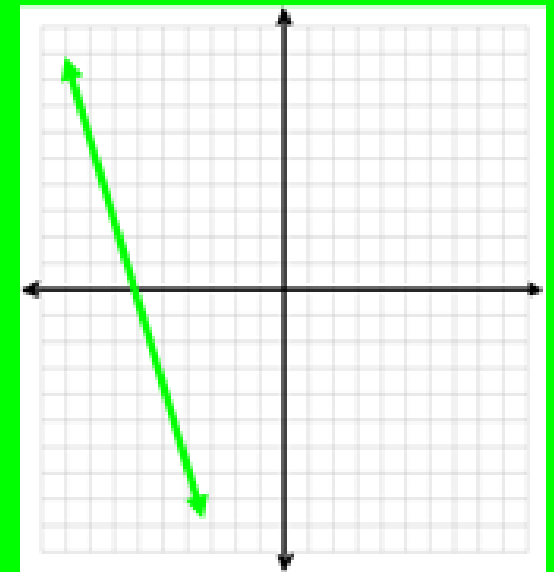
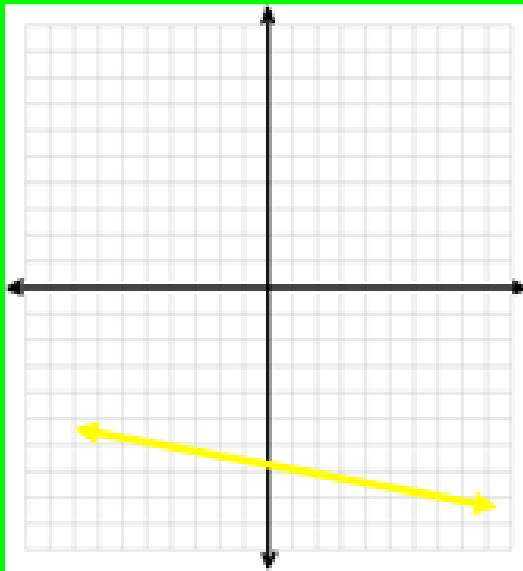
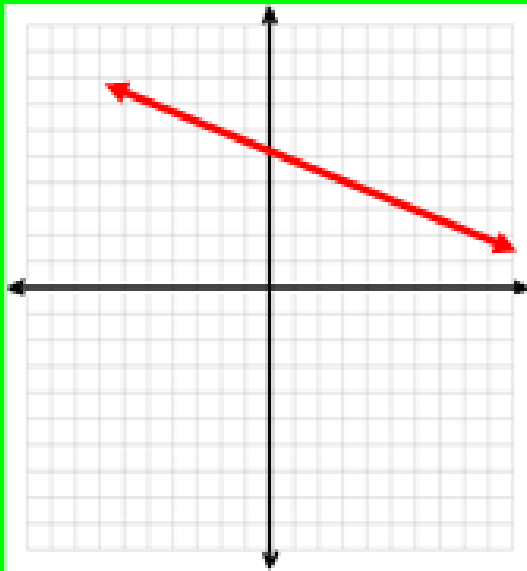
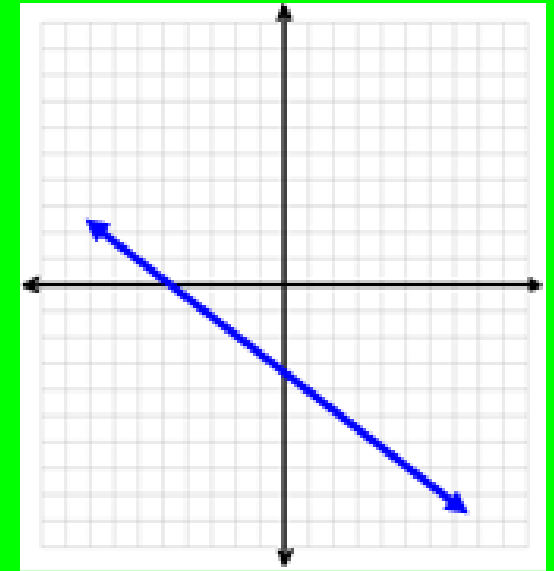
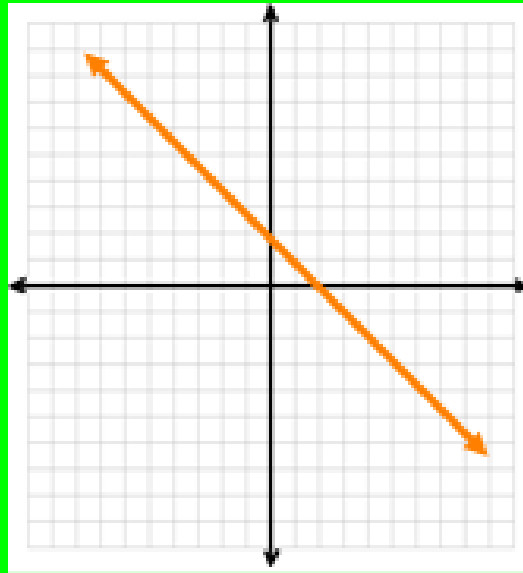
Positive Slope Graphs

$$m > 0$$

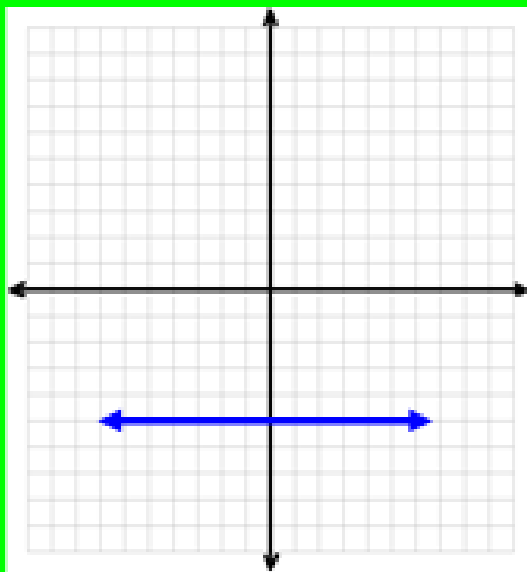
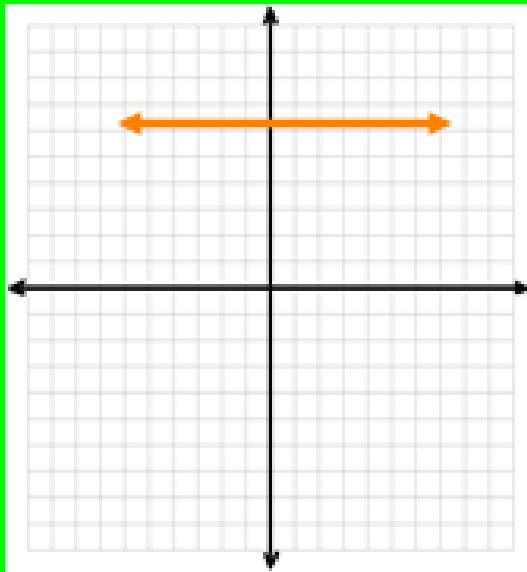


Negative Slope Graphs

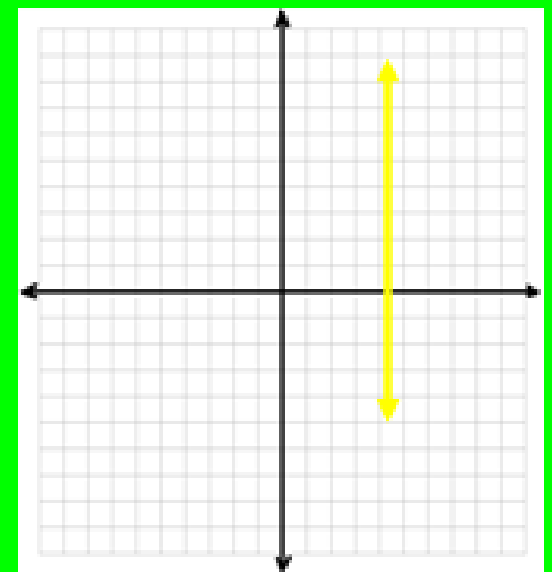
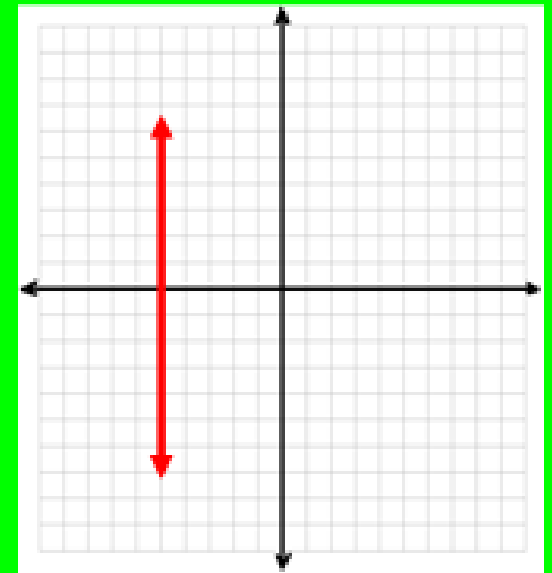
$$m < 0$$



Slope=0 Graphs

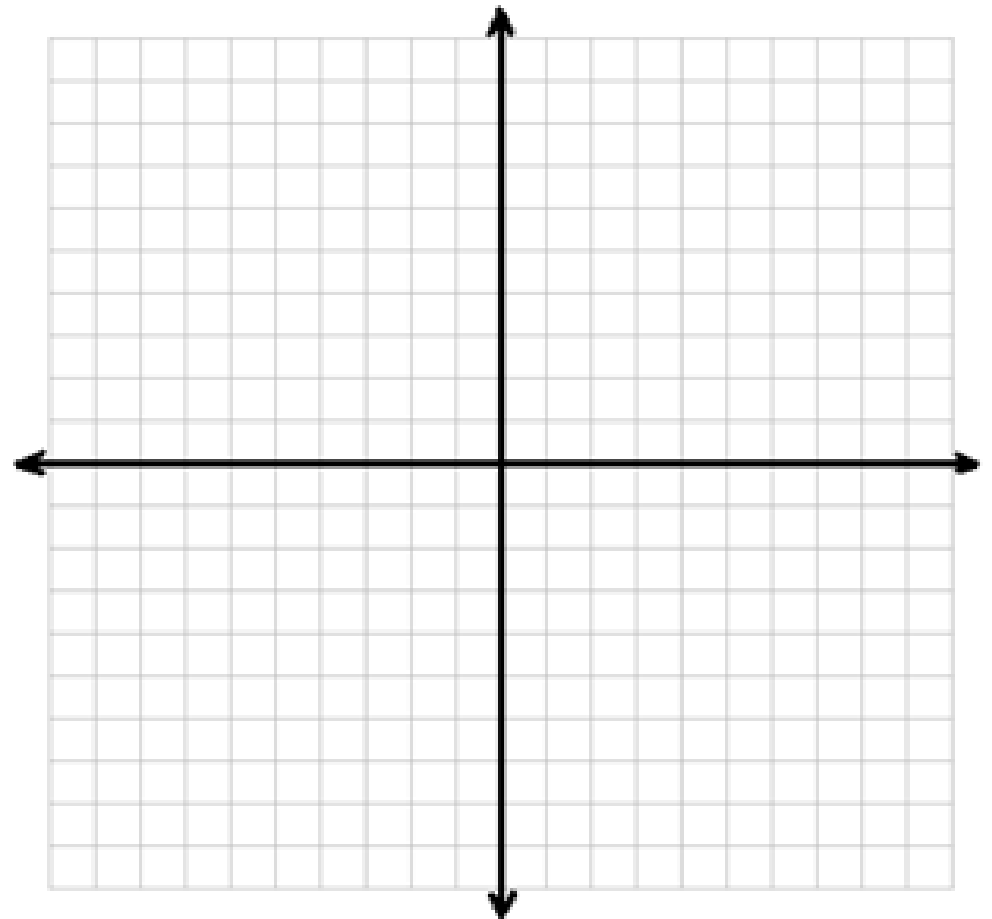


No Slope Graphs (Undefined Slope)



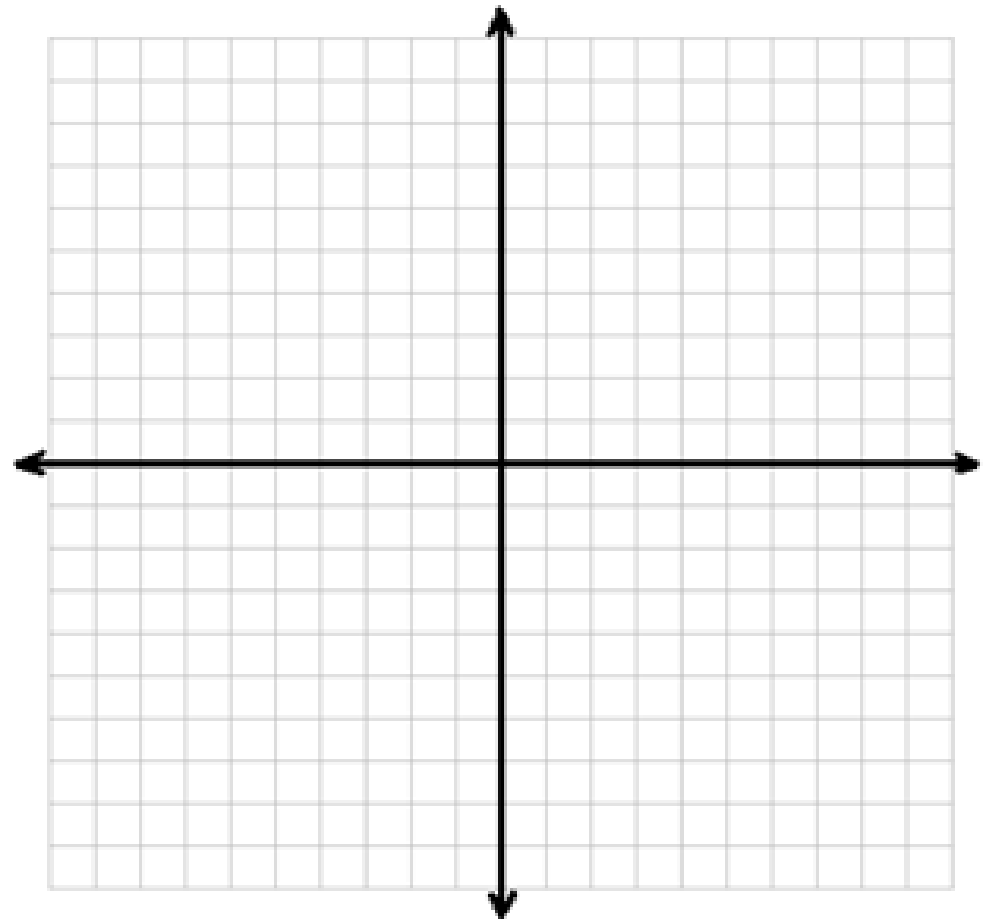
Lesson 3.2: Slope and Equations of Lines

Example 5: Find the Slope of the line that passes through the points $(3,4)$ and $(6, -8)$.



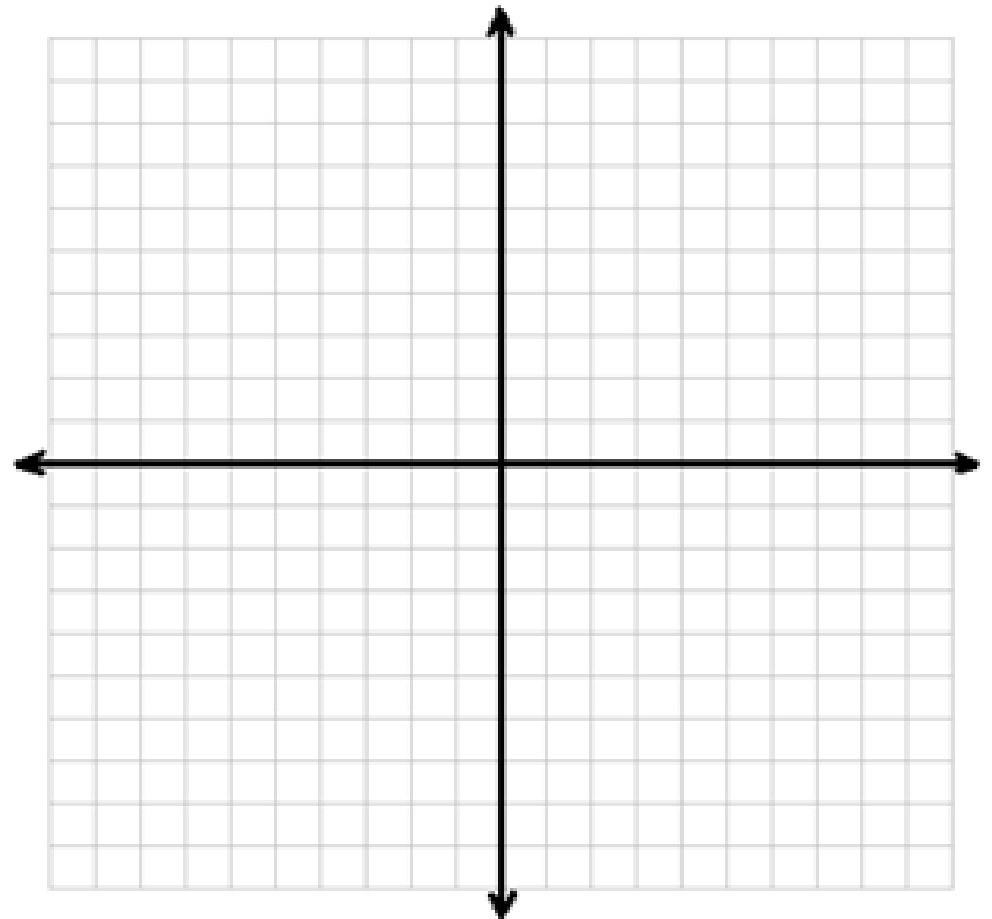
Lesson 3.2: Slope and Equations of Lines

Example 6: Find the Slope of the line that passes through the points $(1, 2)$ and $(-3, -7)$.



Lesson 3.2: Slope and Equations of Lines

Example 7: Find the Slope of the line that passes through the points $(-2, -4)$ and $(-4, -8)$.



Lesson 3.2: Slope and Equations of Lines

We always want our equations to be in **Slope-Intercept Form** so we can graph them easier, but sometimes we are not given the information we need. So we have another form that we can use to help us get our equation into **Slope-Intercept Form**.

It is called **Point-Slope Form**.

Point-Slope Form

Point-Slope form uses a point and the slope to create a linear equation.

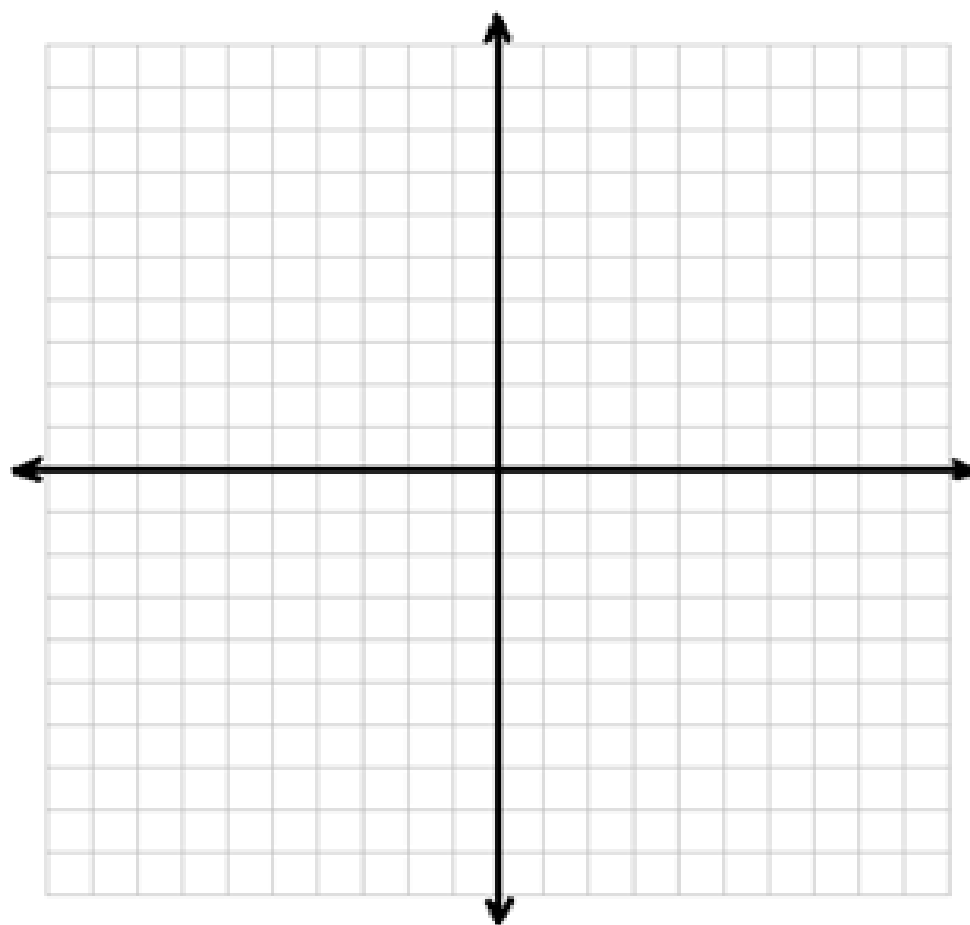
(x_1, y_1) and m

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

Lesson 3.2: Slope and Equations of Lines

Example 8: What is the equation of the line that has slope of 3 and goes through (3, 5)?

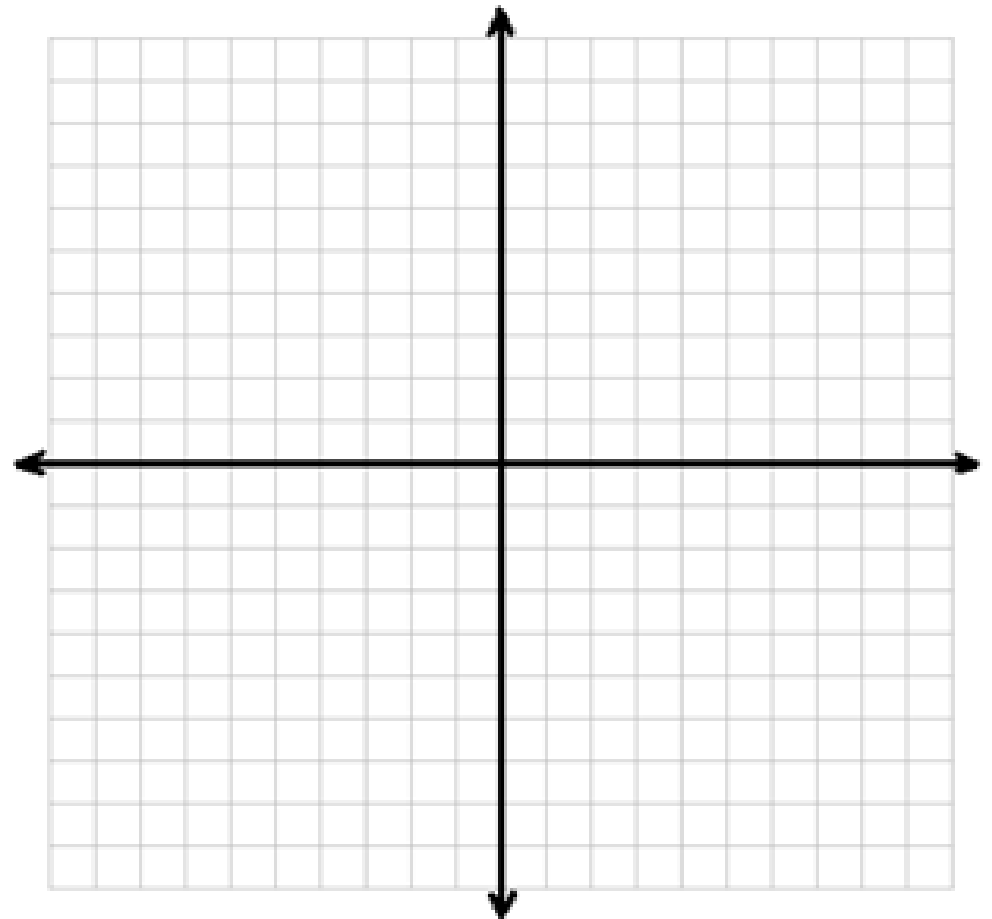
(Write in Slope-Intercept Form using Point-Slope Form.)



Lesson 3.2: Slope and Equations of Lines

Example 9: What is the equation of the line that goes through $(-2, 3)$ and $(1, -1)$?

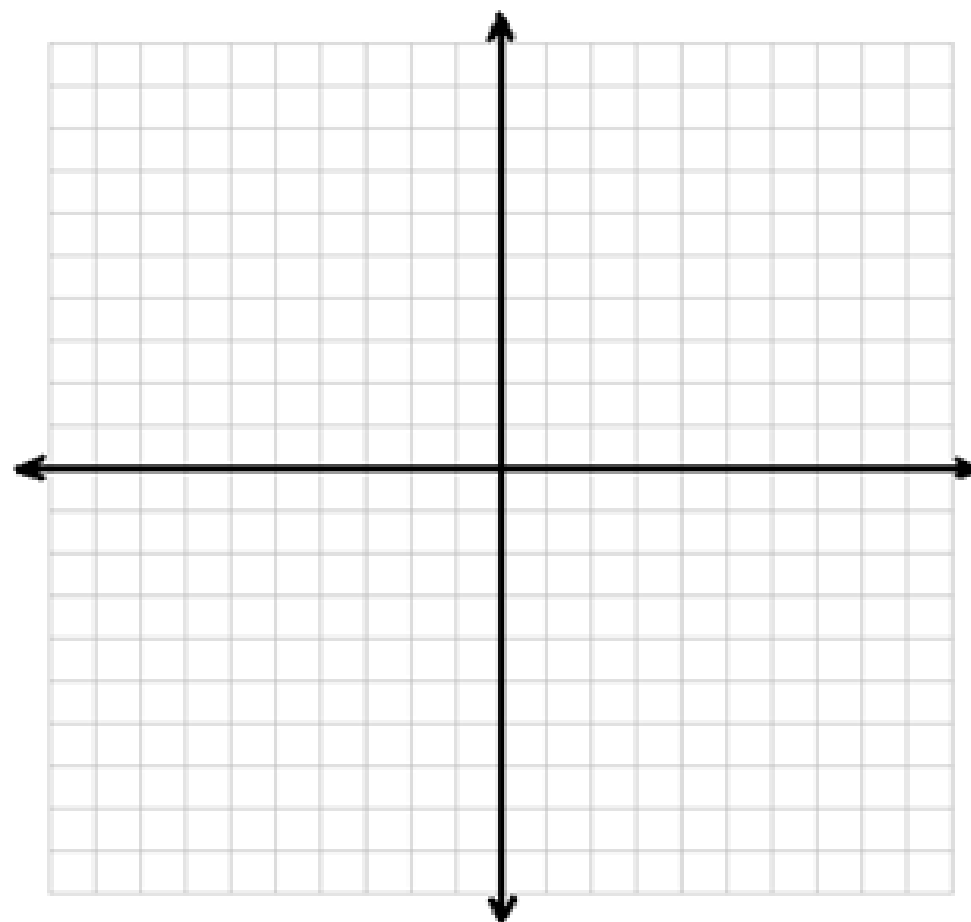
Hint: Find the Slope first.



Lesson 3.2: Slope and Equations of Lines

Example 10: Find a linear function, f , such that $f(2)=7$ and $f(3) = 4$. What is $f(5)$?

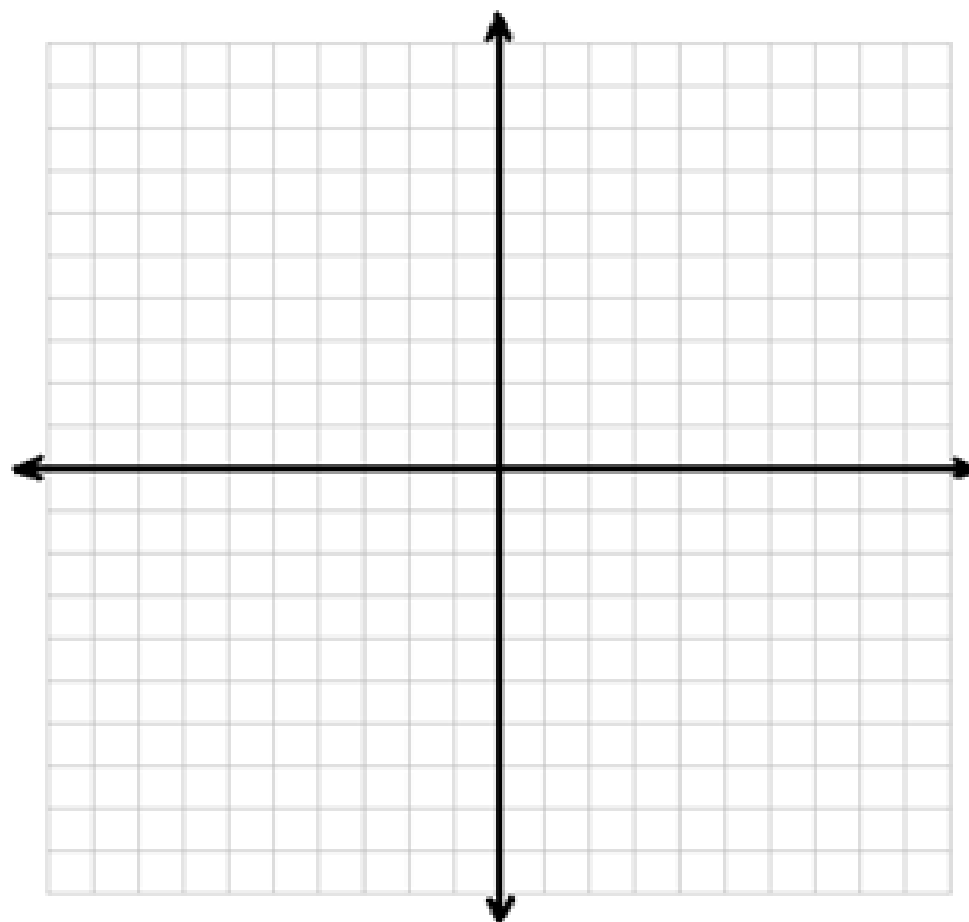
Hint: Find the Slope first.



Review!

Lesson 3.2: Slope and Equations of Lines

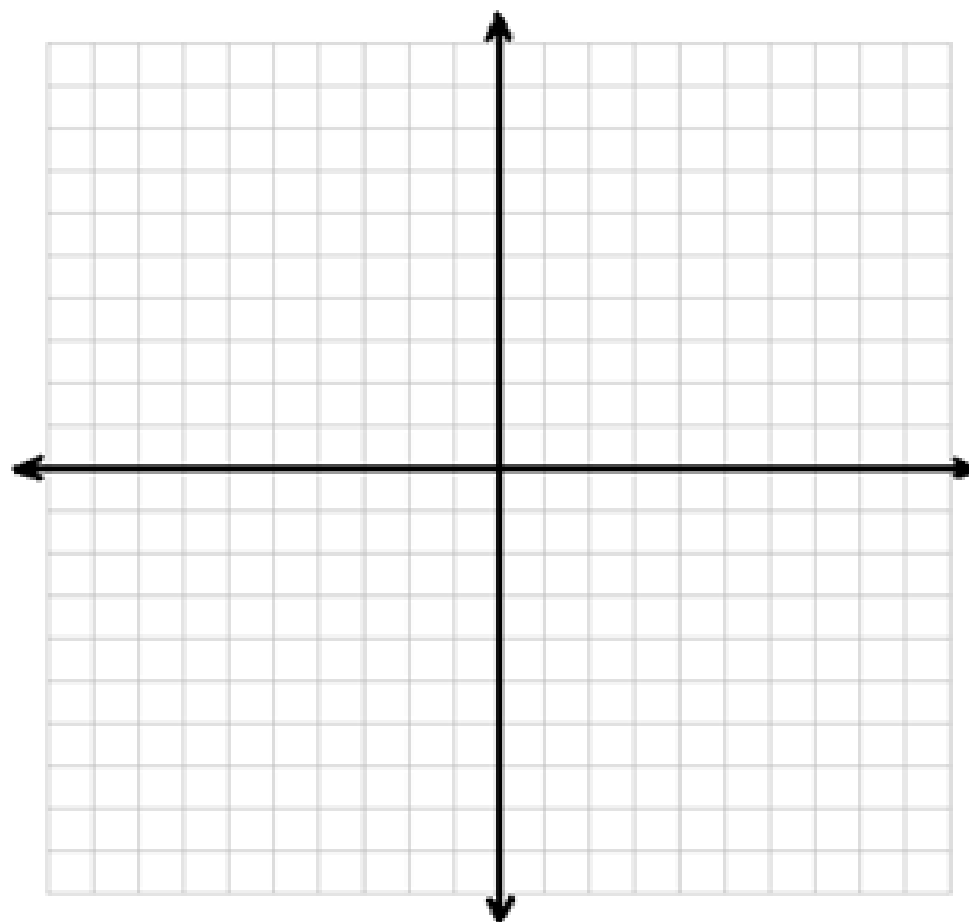
Example 11: Write the Equation of the line that has slope -2 and y -intercept of 5 .



Lesson 3.2: Slope and Equations of Lines

Example 12: Find the X and Y intercepts of the following equation and then graph.

$$3x - y = 12$$





Homework:



Pg. 210-215:

#'s 1-12 all, 13, 15, 23, 25,
29, 33, 39, 43, 47, 51, 61, 67,
77, 83, 89, 95