2.2: Point-Slope Form

SWBAT graph and write lines in point-slope from.

Assignments:

HW15

Equations of Lines

- Solution
  - The value(s) that make a statement true
- Think about $y = 3x + 2$
- What can we decide about its solutions?

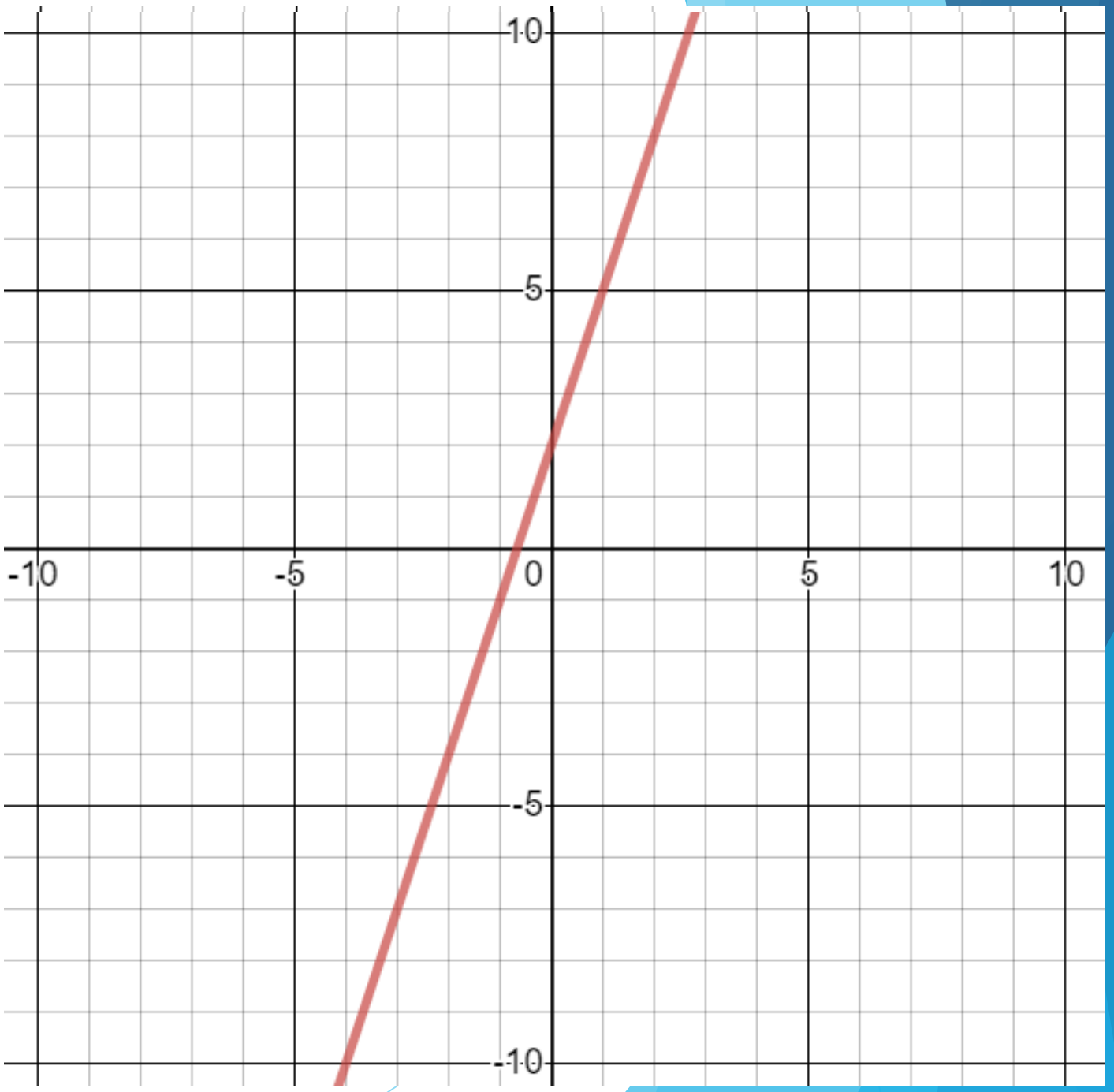
- Is $(3, 9)$ a solution to this equation? How do we know?

- Is $(0,2)$ a solution to this equation? How do we know?

- How many solutions does $y = 3x + 2$ have?

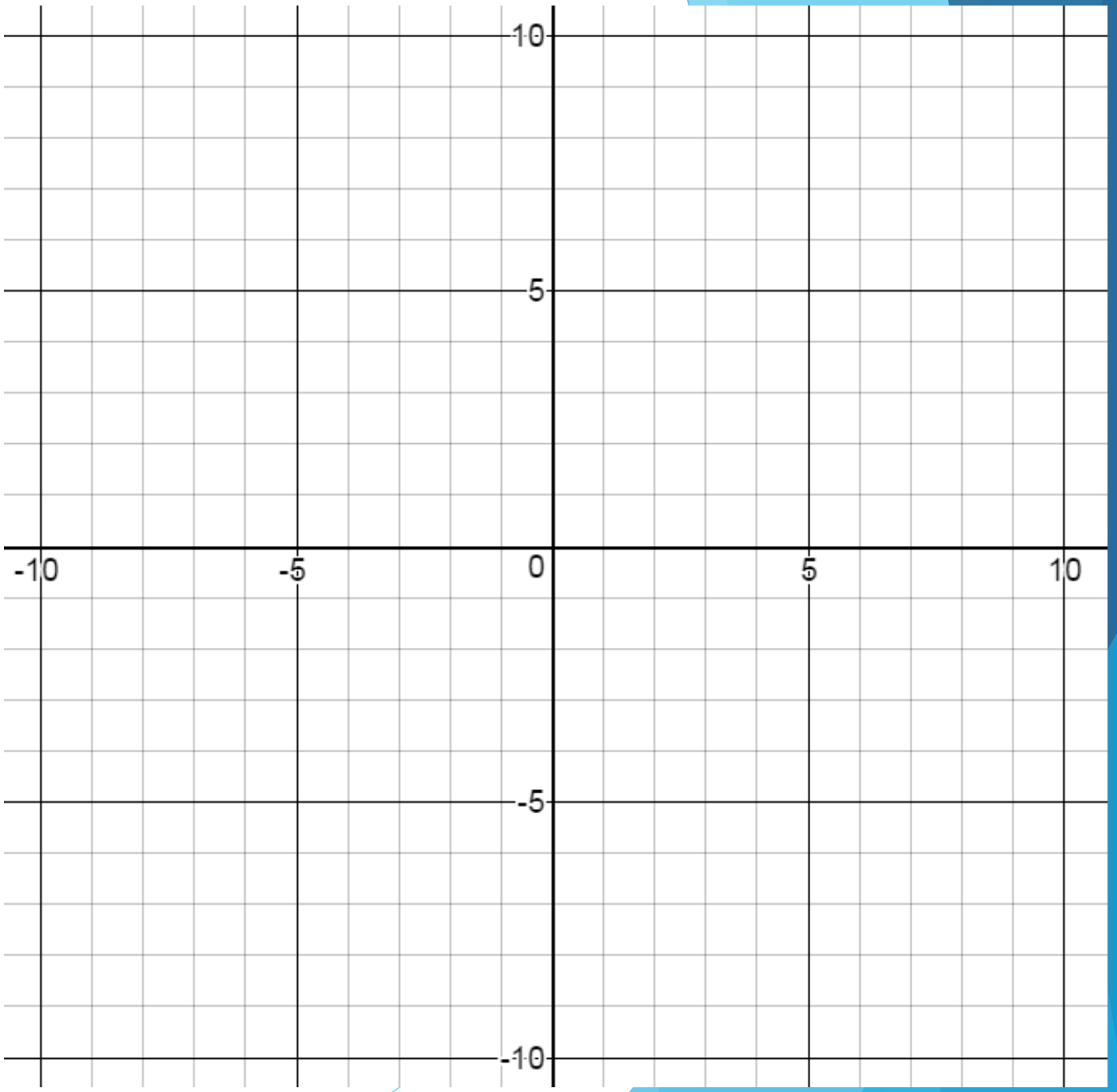
Equations of Lines

- How many solutions does the equation $y = 3x + 2$ have?
- Graphs contain all the solutions to an equation with 2 (or more) variables
- Is $(1, 5)$ a solution to $y = 3x + 2$? Why or why not?
- Is $(-4, -2)$ a solution to $y = 3x + 2$? Why or why not?



Graphs of Lines

- We need two things in order to graph a line:
  - One Point
  - Slope
- The point gives us a starting point
- Slope gives us direction and distance to next point from the one we already have



Graphs of Lines

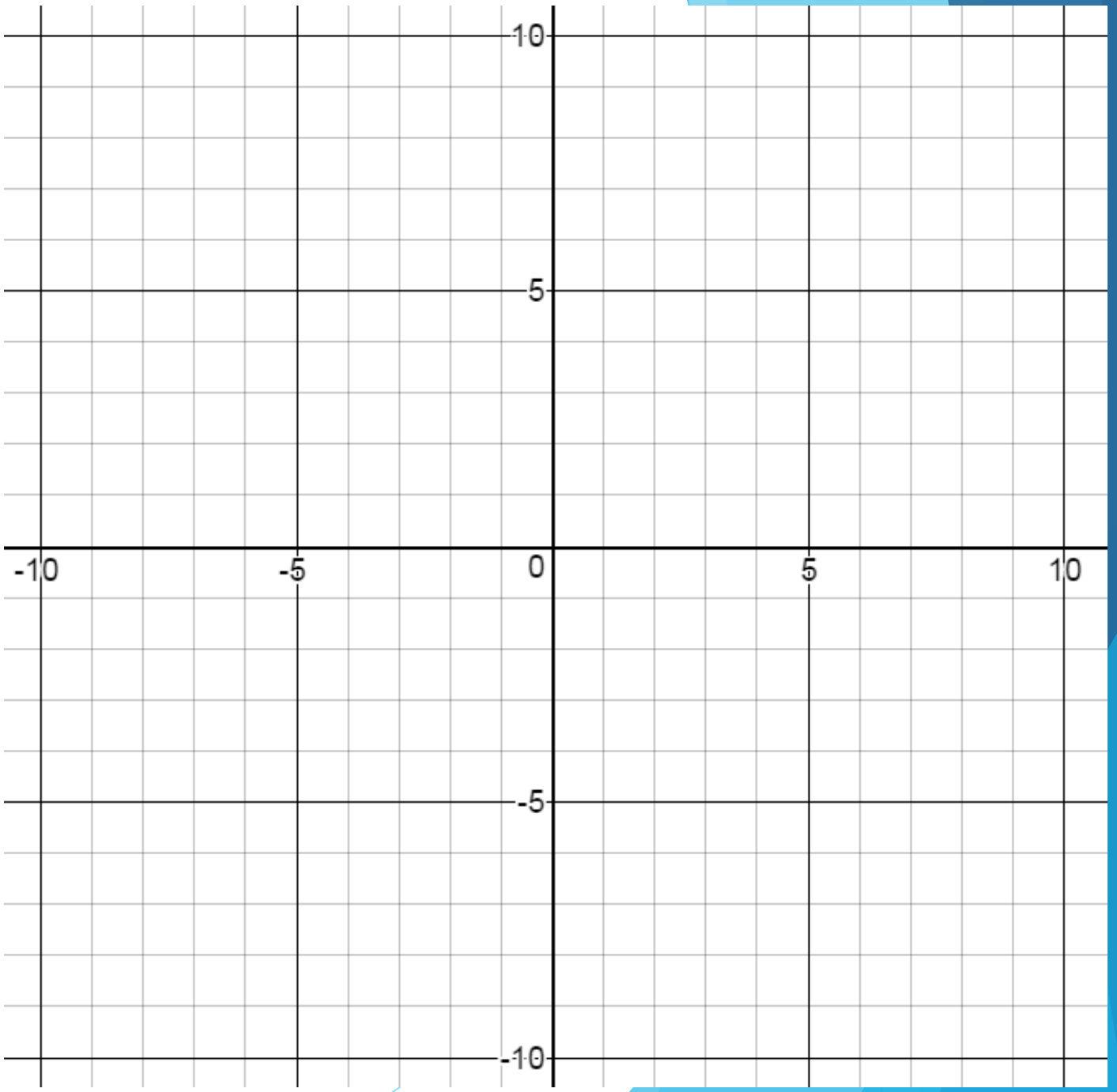
- Ex: Point: $(-4,5)$; slope $m = -\frac{1}{2}$

1. Plot the point.

2. Use the slope to find your next point.

3. Repeat step 3.

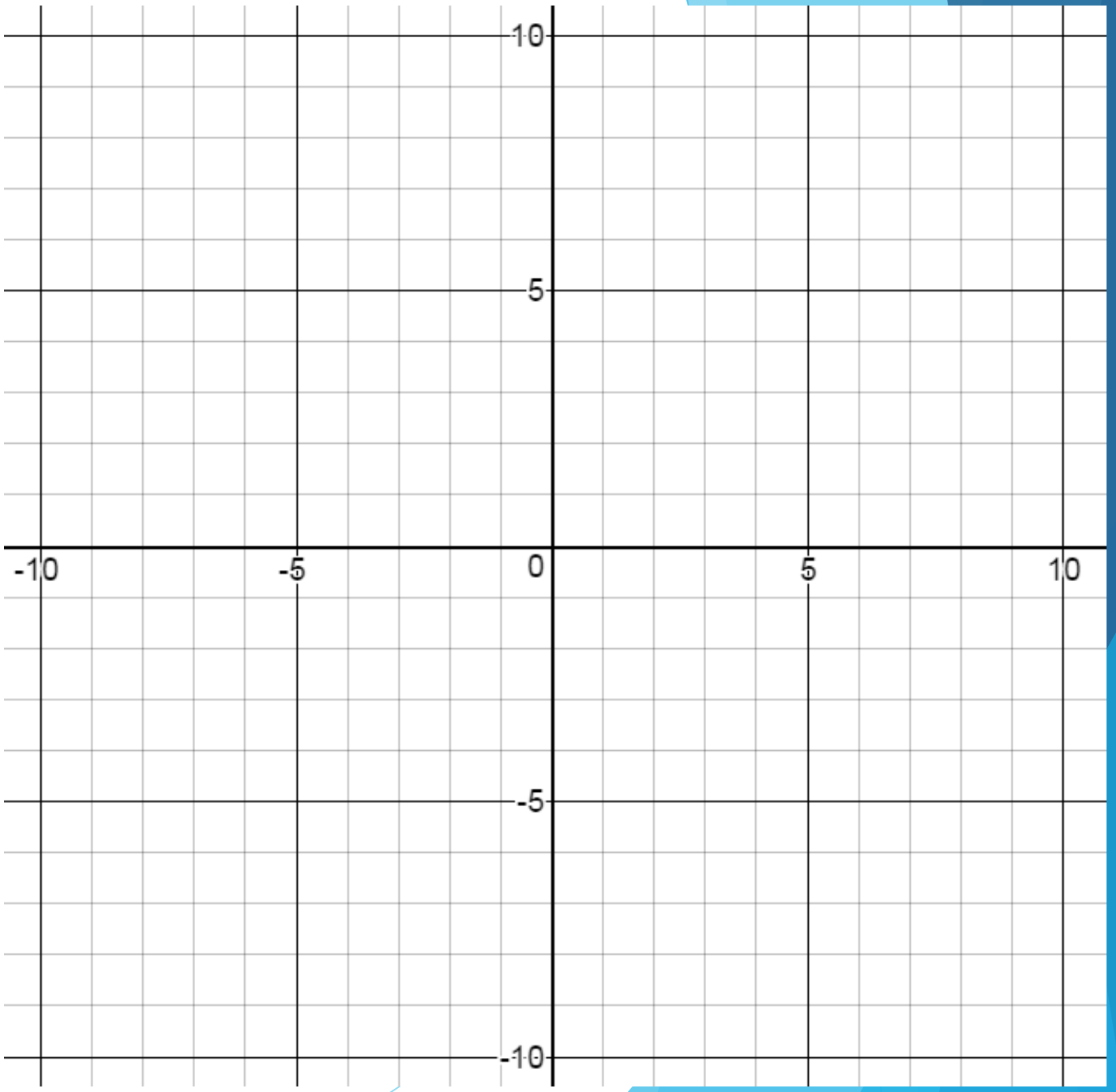
4. Draw a straight line through your points. (You need at least 3)



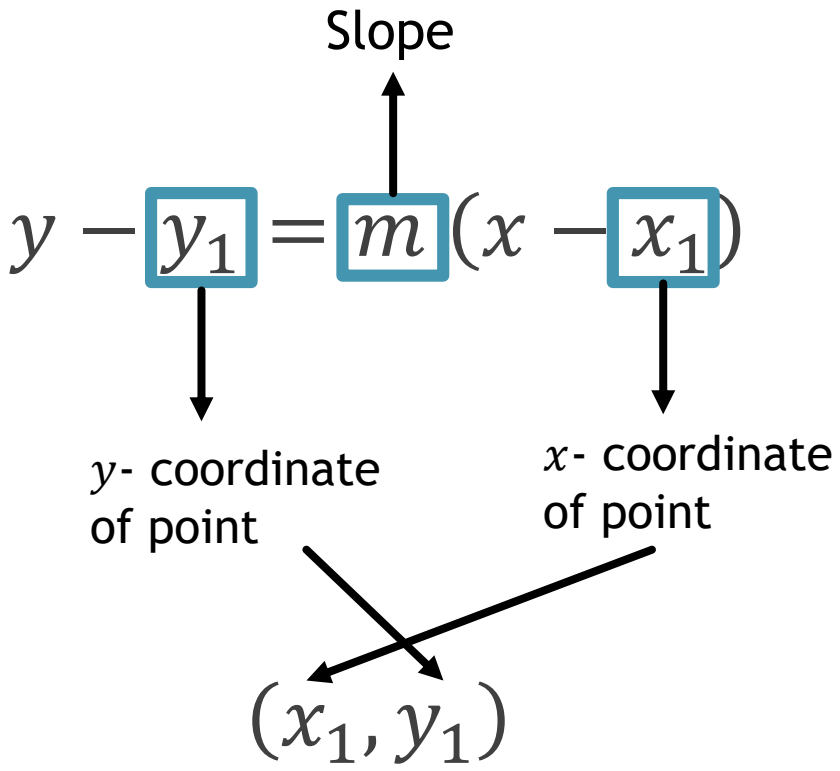
Graphs of Lines

- Graph the lines given the point and slope.
- *No more than 3 lines per grid!*

1. $(-8, 1); m = \frac{2}{5}$
2. $(3,2); m = -\frac{3}{2}$
3. $(-9, -7); m = 4$
4. $(4, -6); m = -\frac{1}{2}$
5. $(3, 0); m = \frac{2}{3}$
6. $(0, -1); m = -5$



Point-Slope Form



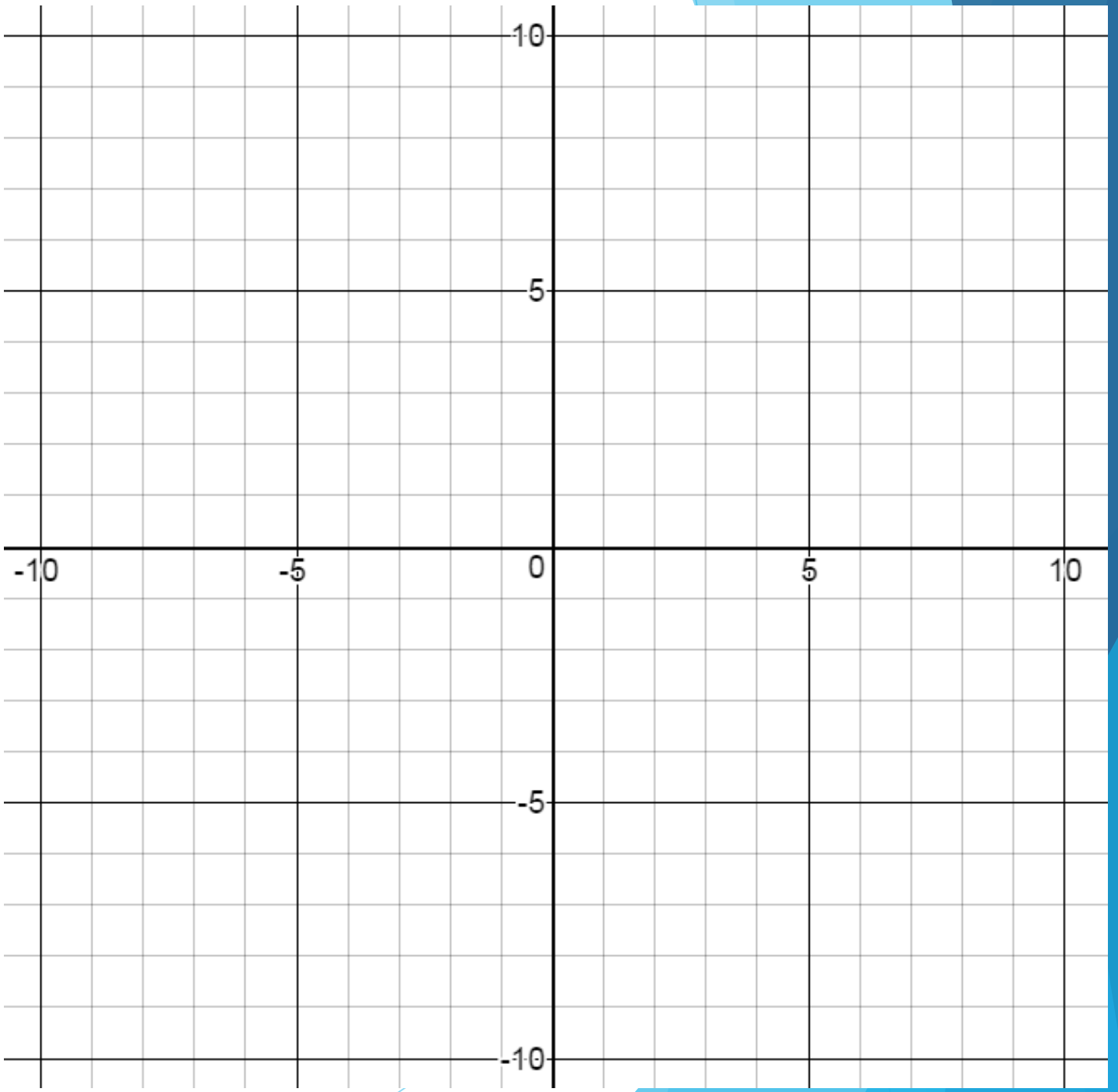
- Identify the point and slope in the equation $y - 4 = -3(x - 5)$
- Identify the point and slope in the equation $y + 3 = -4(x + 2)$

There are two other forms of equations of lines – slope-intercept and standard – that we will talk about in later lessons

Point-Slope Form

- $y - y_1 = m(x - x_1)$
- Identify the point and slope, then graph the line.
- Ex. $y - 4 = \frac{1}{2}(x + 5)$

1. $y - 2 = -2(x - 1)$
2. $y + 3 = \frac{5}{3}(x + 7)$
3. $y = \frac{1}{2}(x - 2)$



Writing Equations of Lines: Point-Slope Form

- Write the point-slope form of the equation of the line through the given point with the given slope.
- Ex. through $(2, -1)$; slope $= 7$

1. Through $(3, 2)$; slope $= -2$
2. Through $(-1, -3)$; slope $= 1$
3. Through $(0, 2)$; slope $= \frac{1}{3}$
4. Through $(-4, 0)$; slope $= \frac{9}{5}$
5. Through $(12, 17)$; slope $= -6$