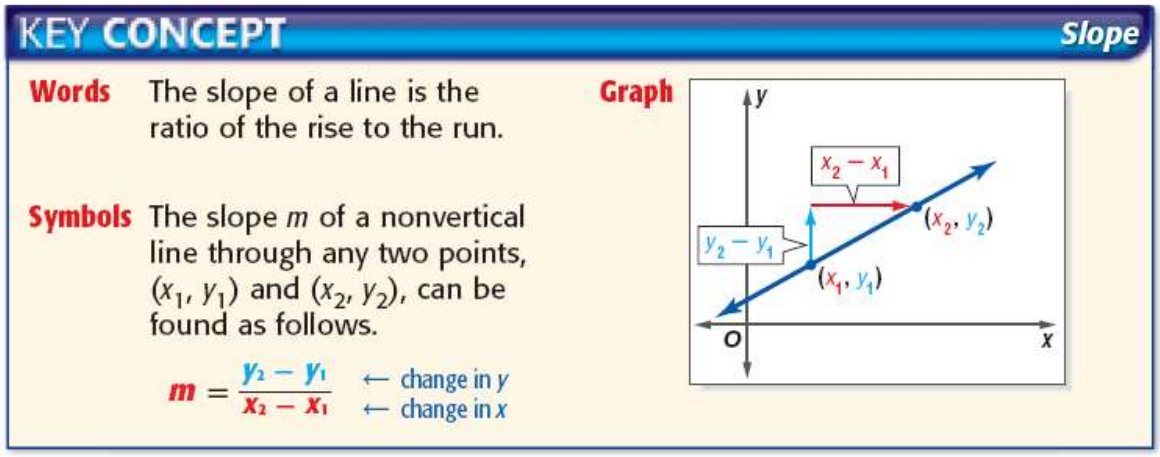
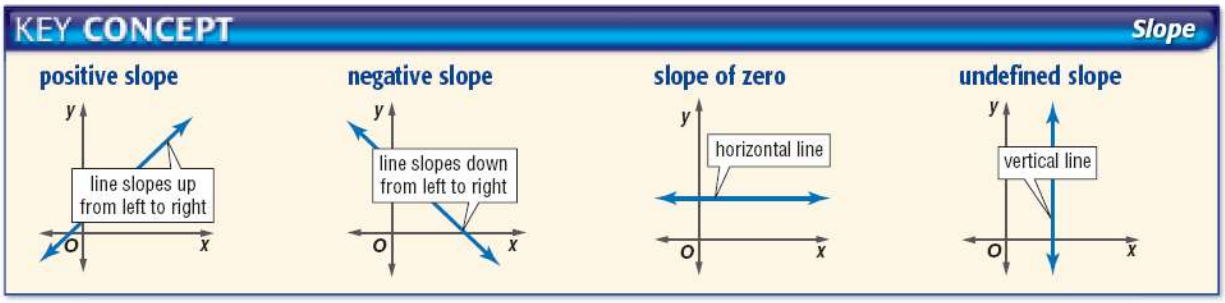
Slope from Graphs

Slope:

The slope of a line is the ratio of the change in the y-coordinates (rise) to the change in the x-coordinates (run).



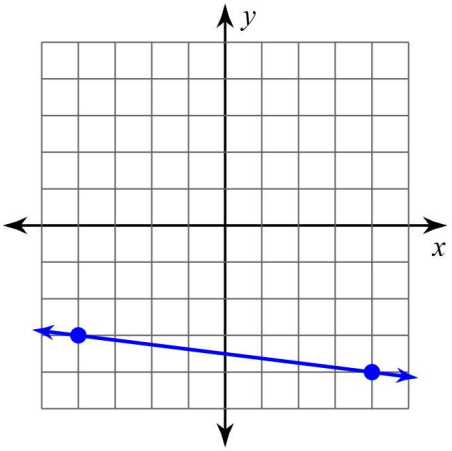
For simplicity, I will use the delta symbol (Δ) to represent "change in." So, $\frac{change\ in\ y}{change\ in\ x} = \frac{\Delta y}{\Delta x}$.



For this lesson we will focus solely on the graphs. So, we will be concerned with vertical change (Δy) and horizontal change (Δx)

Example 1:

Find the slope of the line.

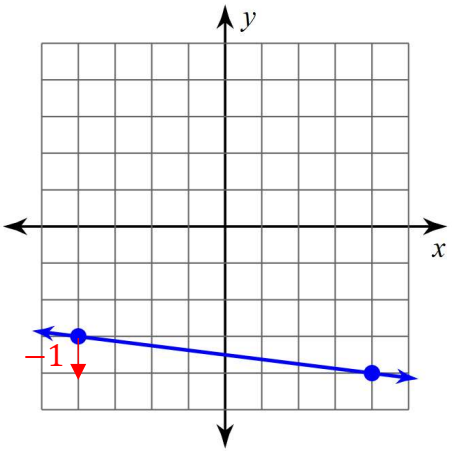


We can start at either point, and we will get the same slope.

If we start with the point on the left:

Let's start by finding the vertical change to get even with the rightmost point.

It is a negative one, because we have to move down which is a negative movement.



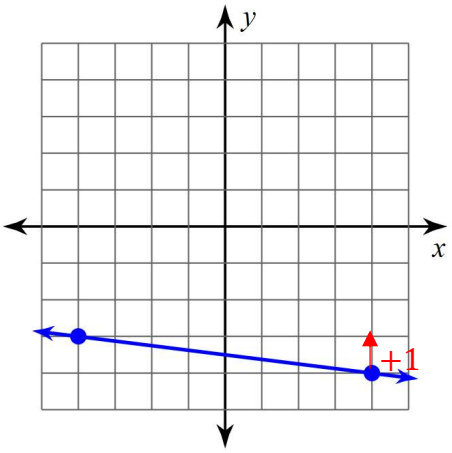
Now, let's find the horizontal change to meet up with the second point.

It is a positive eight because we have to move to the right which is a positive movement.

If we start with the point on the right:

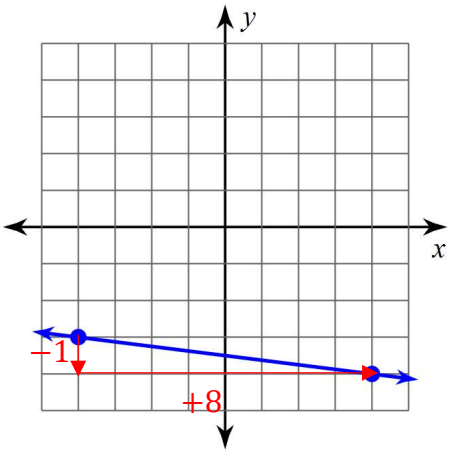
Let's start by finding the vertical change to get even with the leftmost point.

It is a positive one, because we have to move up which is a negative movement.

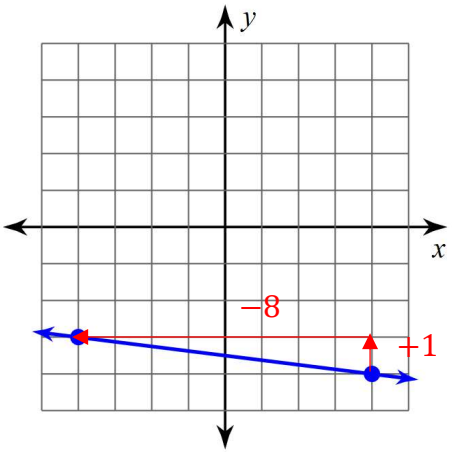


Now, let's find the horizontal change to meet up with the second point.

It is a negative eight because we have to move to the left which is a negative movement.



Now, we calculate slope. $\frac{\Delta y}{\Delta x} = \frac{-1}{8} = -\frac{1}{8}$



Now, we calculate slope. $\frac{\Delta y}{\Delta x} = \frac{1}{-8} = -\frac{1}{8}$

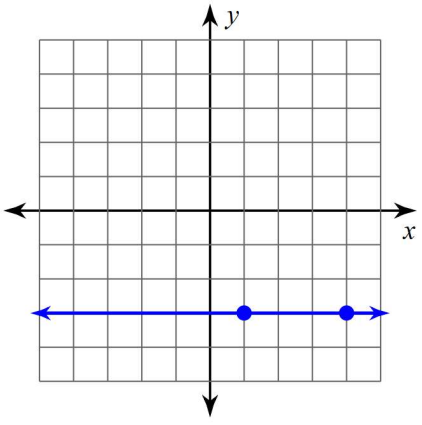
We get the same slope either way. **The slope is $-\frac{1}{8}$.**

As a double-check, notice that our line is falling and we have a negative slope, so we know we have probably done this problem correctly.

**As we move forward in this lesson it will be important to remember that moving up or right are positive movements. Moving down or left are negative movements.

Example 2:

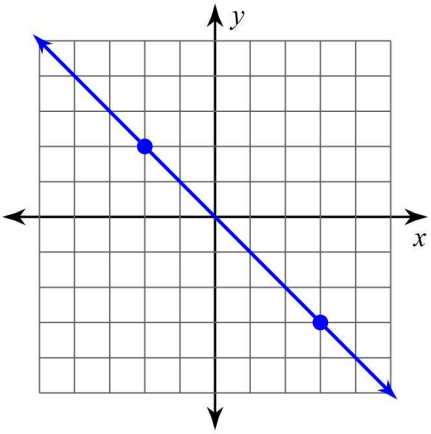
Find the slope of the line.



This is a horizontal line, so **the slope is 0.**

Example 3:

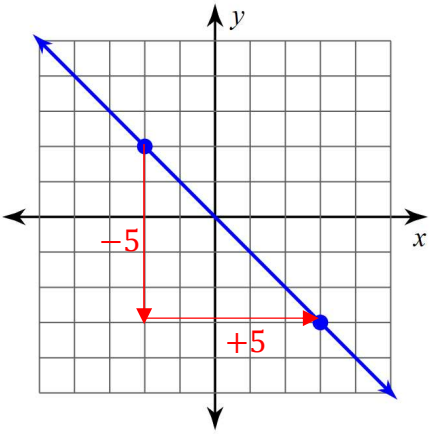
Find the slope of the line.



We can start at either point, and we will get the same slope.

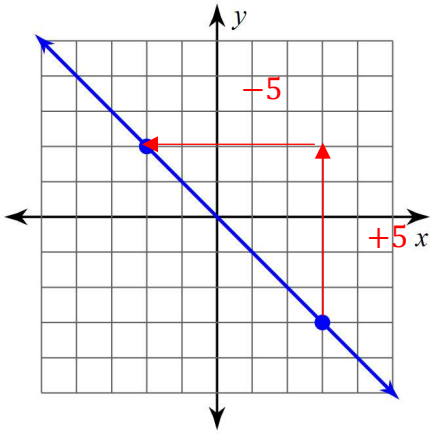
If we start with the point on the left:

Let's find our changes.



Now, we calculate slope. $\frac{\Delta y}{\Delta x} = \frac{-5}{5} = -1$

If we start with the point on the right:



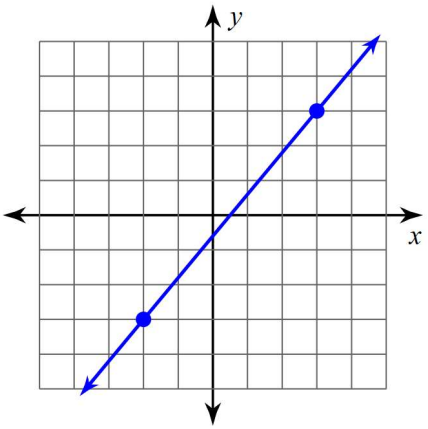
Now, we calculate slope. $\frac{\Delta y}{\Delta x} = \frac{5}{-5} = -1$

We get the same slope either way. **The slope is -1.**

As a double-check, notice that our line is falling and we have a negative slope, so we know we have probably done this problem correctly.

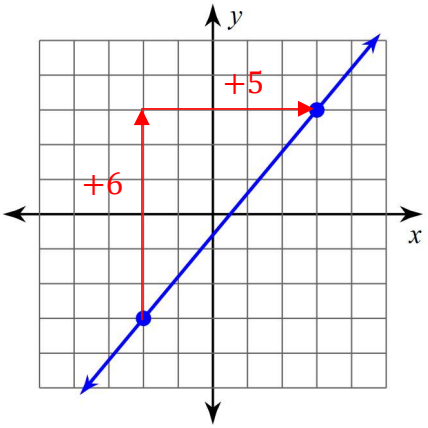
Example 4:

Find the slope of the line.



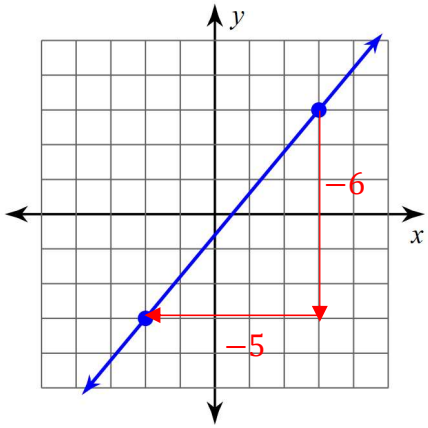
We can start at either point, and we will get the same slope.

If we start with the point on the left:



Now, we calculate slope. $\frac{\Delta y}{\Delta x} = \frac{6}{5}$

If we start with the point on the right:



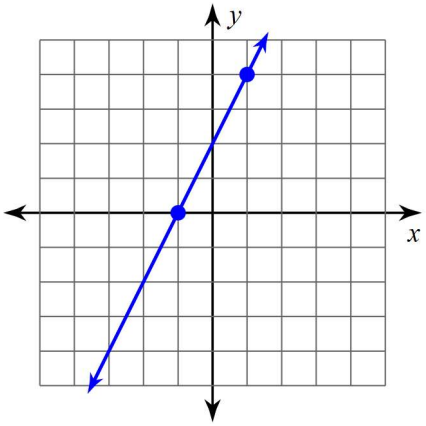
Now, we calculate slope. $\frac{\Delta y}{\Delta x} = \frac{-6}{-5} = \frac{6}{5}$

We get the same slope either way. **The slope is $\frac{6}{5}$.**

As a double-check, notice that our line is rising and we have a positive slope, so we know we have probably done this problem correctly.

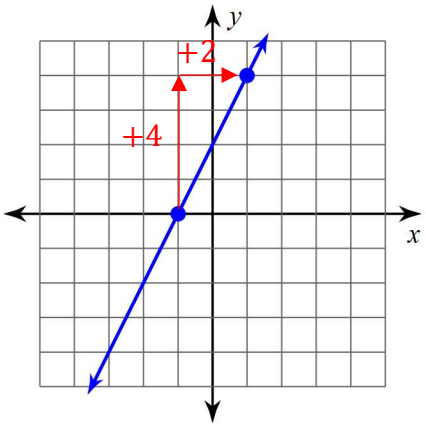
Example 5:

Find the slope of the line.



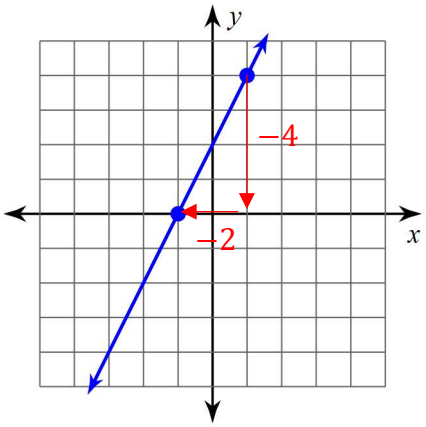
We can start at either point, and we will get the same slope.

If we start with the point on the left:



Now, we calculate slope. $\frac{\Delta y}{\Delta x} = \frac{4}{2} = 2$

If we start with the point on the right:



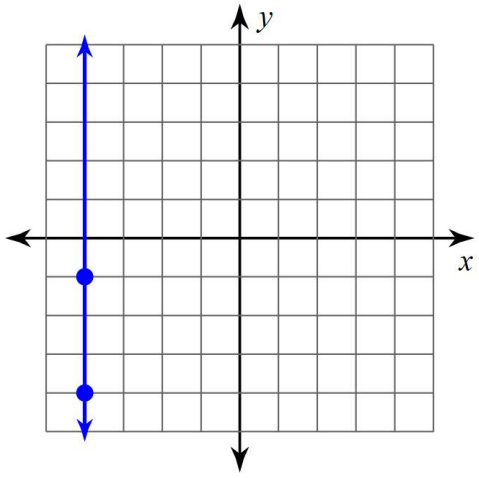
Now, we calculate slope. $\frac{\Delta y}{\Delta x} = \frac{-4}{-2} = 2$

We get the same slope either way. **The slope is 2.**

As a double-check, notice that our line is rising and we have a positive slope, so we know we have probably done this problem correctly.

Example 6:

Find the slope of the line.



This is a vertical line, so **the slope is undefined.**