

Using the TIInspire explore the relationship between the graph of the line and the slope of the line. At the end of this investigation you will be asked to come up with a relationship between the two points and the slope.

Let's begin:

Open a graphs and geometry page.

MENU, 1: tools, 5: show grid.

Plot the point (-1,2). [Press menu, 6: points and lines, 1: point

Label the coordinates of the point: menu, 1: tools , 6: coordinates]

MENU, 6: points and lines, 1: point

From the point move 3 units up and 2 units to the right and place another point.

What are the coordinates of the point? ( \_\_\_\_ , \_\_\_\_ )

What is the slope of the line? \_\_\_\_\_(Use the counting method!)

Using the line tool create a line connecting the two points. MENU, 6: points and lines, 4: line. Now use the measurement tool to calculate the slope of the line.

Move one of the points to a new location. Record the coordinates for both points: Point one: ( \_\_\_\_ , \_\_\_\_ ) Point two: ( \_\_\_\_ , \_\_\_\_ ). Record the slope as a fraction: slope = \_\_\_\_\_

Move one of the points to a new location. Record the coordinates for both points: Point one: ( \_\_\_\_ , \_\_\_\_ ) Point two: ( \_\_\_\_ , \_\_\_\_ ). Record the slope as a fraction: slope = \_\_\_\_\_

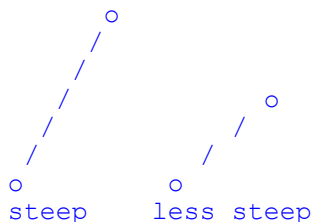
Move one of the points to a new location. Record the coordinates for both points: Point one: ( \_\_\_\_ , \_\_\_\_ ) Point two: ( \_\_\_\_ , \_\_\_\_ ). Record the slope as a fraction: slope = \_\_\_\_\_

Move one of the points to a new location. Record the coordinates for both points: Point one: ( \_\_\_\_ , \_\_\_\_ ) Point two: ( \_\_\_\_ , \_\_\_\_ ). Record the slope as a fraction: slope = \_\_\_\_\_

Can you see a relationship between the points and the slope?

Slope is a measure of the **steepness of the line**. Defined as a ratio of "rise: to "run". Why do we define the word "slope" to mean the ratio of "rise" to "run"?

Any number we assign to a "slope" ought to be bigger when the line is sloped more steeply. We want the "slope" to tell us how much the line is sloped. A steeper line goes up more in the same distance:



If we used the "run" over the "rise", then the less steep line would have a greater slope, which wouldn't make sense:

Explore the concept of  $SLOPE = \frac{RISE}{RUN}$  with the data you collected earlier. Your goal is to come up with an equation that will calculate slope given two points.

Slope = \_\_\_\_\_

Using your formula, calculate the slope for the following sets of point (write the slope as a fraction and a decimal):

1. (1, -4) and (5, -8)  $m =$  \_\_\_\_\_

2. (-3,6) (-3,0)  $m =$  \_\_\_\_\_

3. (-3,3) and (7,-1)  $m =$  \_\_\_\_\_

4. (0,-2) and (9,-5)  $m =$  \_\_\_\_\_

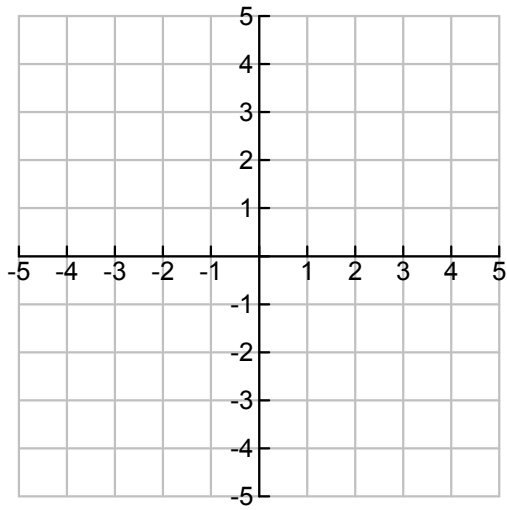
5. (7,1) and (-2, 1)  $m =$  \_\_\_\_\_

6. (-3,-1) and (6, -2)  $m =$  \_\_\_\_\_

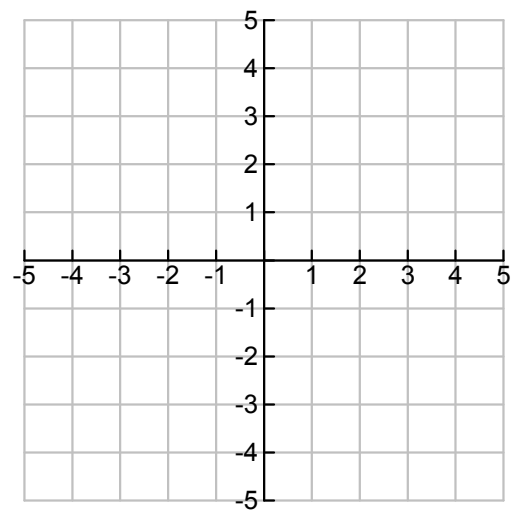
Using the TInspire activity check the reliability of your formula.

Using the TInspire create a line with a positive slope, a negative slope, a slope of zero and a slope of +infinity. Sketch an example of each on the grids provided:

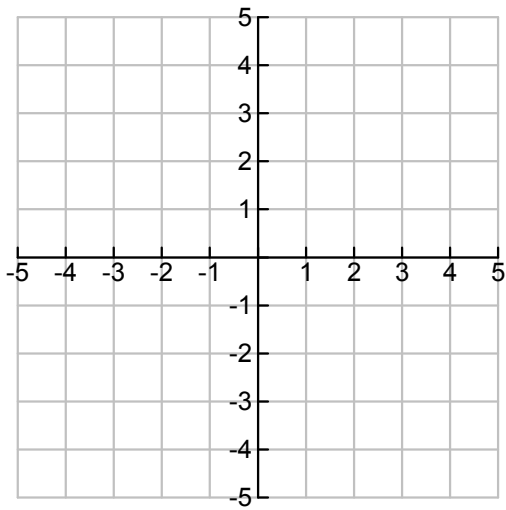
Positive



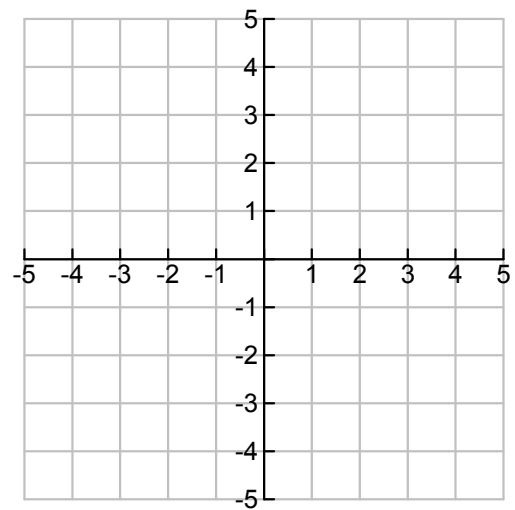
Negative



Zero



+ infinity



$$\text{Slope} = \frac{\text{rise}}{\text{run}} = \underline{\hspace{2cm}}$$