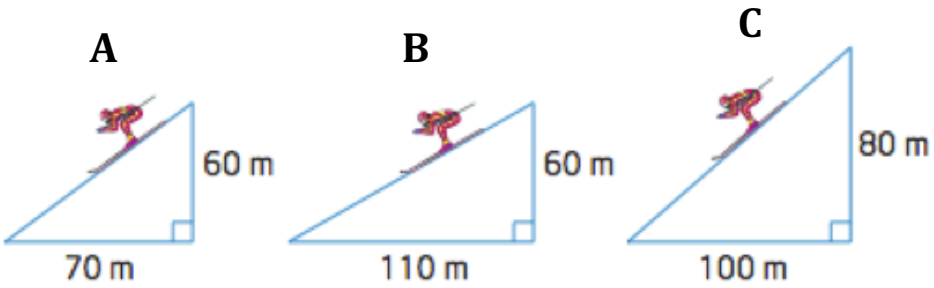
Section 5.3a – Slope

MPM1D

Investigation

Slope: A measurement of the steepness of a line.

The following diagrams represent ski hills.



1. Rank the hills in order of their steepness, from least to greatest.

i. _____ **ii.** _____ **iii.** _____

2. A hill rises 2 meters over a horizontal run of 8 meters. A second hill rises 4 meters over a horizontal run of 10 meters. Which is the steeper hill?

3. Describe your method for determining steepness:

Part 1: How do we find the slope of a line?

The steepness of a line segment is measured by its _____. The slope is the ratio of the _____ to the _____ and is often represented by the letter _____ .

You should maybe be starting to make a connection; what else did we use the letter m to represent?

_____: the vertical distance between two points (Δy)

_____: the horizontal distance between two points (Δx)

$$\boldsymbol{Slope = m = \frac{rise}{run} \quad or \quad \frac{\Delta y}{\Delta x}}$$

When determining the rise and run of a line from its graph you must know that:

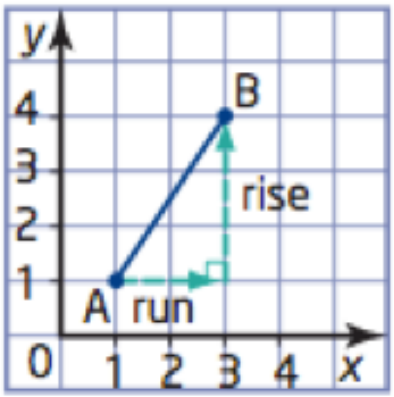
Counting units in the upward direction gives a _____ rise

Counting units in the downward direction gives a _____ rise

Counting units to the right gives a _____ run

Counting units to the left gives a _____ run

Example 1: Count the units on the grid to determine the rise and run.



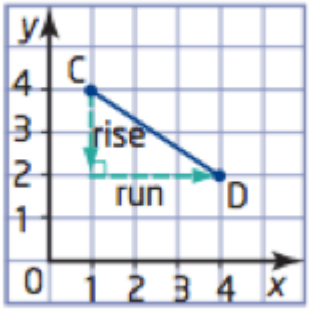
rise = _____

run = _____

What's the slope of this line?

Example 2:

Example 2: Count the units on the grid to determine the rise and run



rise = _____

run = _____

What's the slope of this line?

Looking at example 1:

Is the slope positive or negative? _____

What direction does the line go? _____

Looking at example 2:

Is the slope positive or negative? _____

What direction does the line go? _____

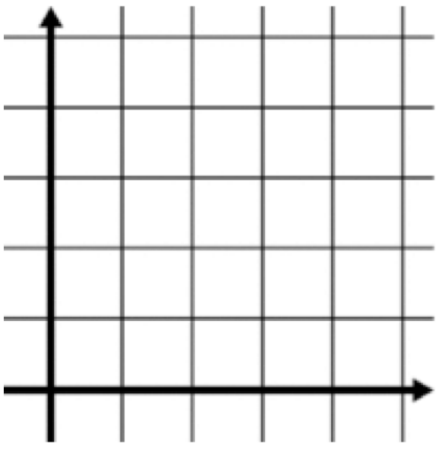
Conclusion about positive and negative slopes:

A line that _____ has a positive slope.

A line that _____ has a negative slope.

<u>Part 2: Finding the slope of vertical and horizontal lines</u>

Step 1: Plot the points A(1,1) and D(5,1) on the graph provided. Connect the points to form the line segment AD.



Step 2: Determine the rise and the run of line AD

rise = run = m =

The slope of any horizontal line is _____

Step 3: Plot the point E(1,5) on the same grid. Connect it to point A to form the line segment AE.

Step 4: Determine the rise and the run of line AE

rise = run = m =

The slope of any vertical line is _____

Part 3: Practice Finding Slopes

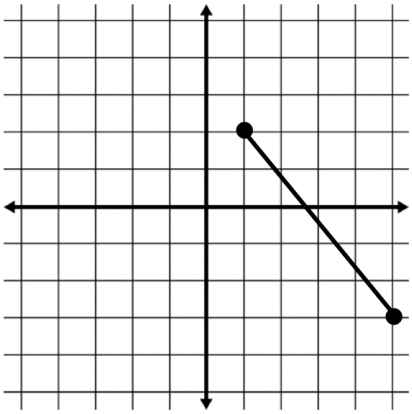
Calculate the slope of each line segments

Example 3:

rise is:

run is:

m =

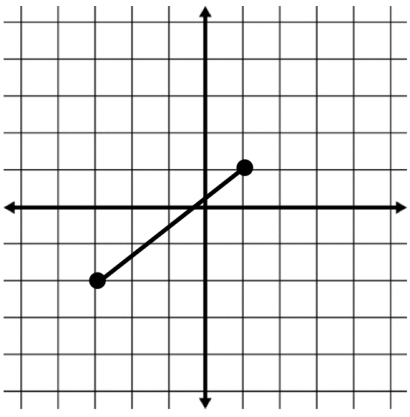


Example 4:

rise is:

run is:

m =



Example 5: The ramp at a loading dock rises 2.5 meters over a run of 4 meters.

What is the slope of the ramp?