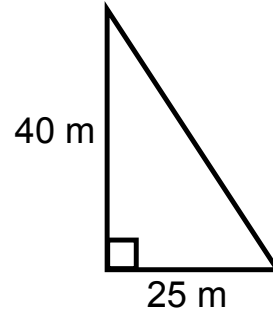
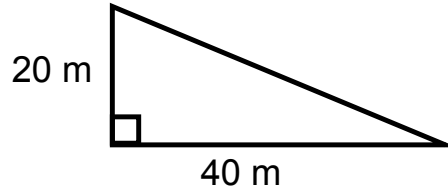
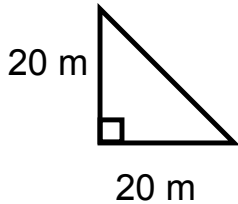


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Bell Work

- 1) The diagrams shown represent ski hills. Rank the hills in order of their steepness.



- 2) Another hill rises 40 m while covering a horizontal distance of 50 m. Draw and label the hill and then determine its steepness.
- 3) How did you determine steepness? Does this measure have units? Why or why not?
- 4) What would we have called this comparison in Unit 1?
- 5) Give an example of a time where your slope would have units (think about Unit 2!). What is this called?



Date: _____

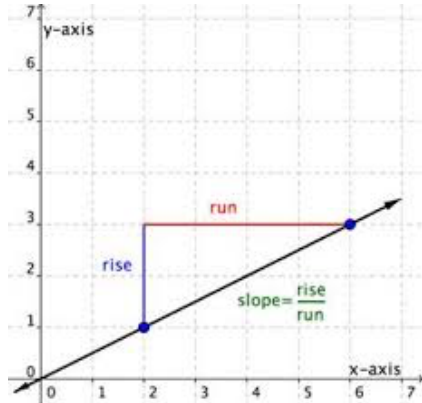
5.3 Slope

Slope is the measure of the steepness of a line. As you saw in the bell work questions, slope is an example of a ratio (if both measurements are in the same units)/rate (if your measurements are in different units). We actually found the slope of lines in Unit 2 when we found the speed from distance time graphs.

When you are stating the slope of a line, you must be sure to compare the **rise** (vertical distance between two points) to the **run** (horizontal distance between two points).

$$\text{Slope} = m = \frac{\text{rise}}{\text{run}}$$

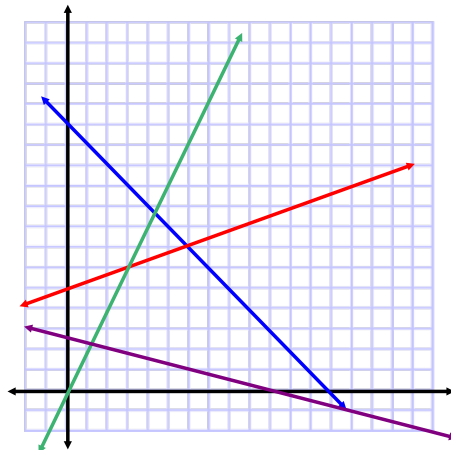
Slope and rate of change are the same thing, and should be **expressed as a fraction in lowest terms** (unless it is a real world situation where a decimal is more appropriate - ex/ hourly wage).



ex/ State the slope of the line. Is this a direct or partial variation? Why?

Positive and Negative Slope

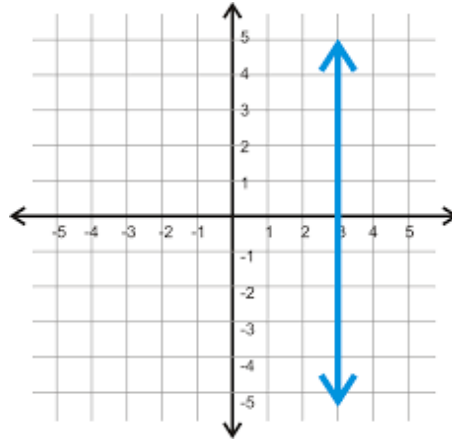
Look at the lines given below. Which ones do you think have a positive slope? A negative slope? Explain your thinking.



Draw a line that you think would have a slope of zero, and then explain your reasoning.

Slope of Vertical Lines

What happens when you try to write the rise over the run for a vertical line?



The Cartesian Plane - Graphing in Four Quadrants

The grid shown above is called the Cartesian Plane. Until now, the majority of the graphing you have done has occurred in the top right part of this plane (Quadrant 1). We can number the other quadrants counterclockwise, starting from one.

Which axis is the x - axis?

Which axis is the y - axis?

Do we determine the rise of a line by looking at its change along the x-axis or the y-axis? What about the run?

On the grid above, plot the points $(-2, 4)$ and $(2, -4)$, keeping in mind that points are always listed alphabetically, (x, y) . Draw a line between the points and find its slope.

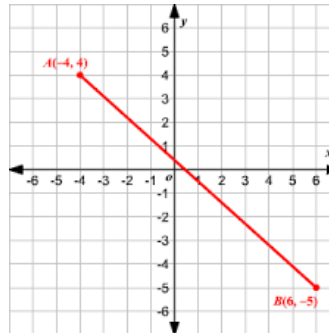
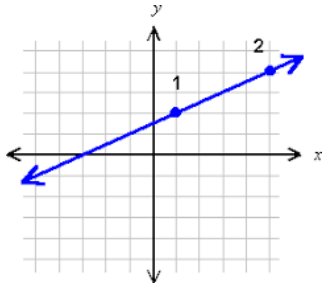
Is this an example of direct variation or partial variation?

Solving Problems Involving Slope

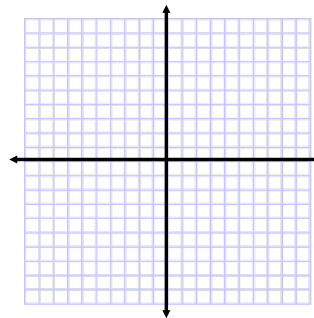
- Create a triangle so that you can label the rise and the run (these are just the lengths of the sides of the triangle!)
- If there is a grid, be sure to look at the scale (sometimes one box might represent 20 units).
- Write a ratio comparing the rise to the run.
- Put it in to lowest terms.

Practice Problems:

1) Find the slope of the lines shown below.



2) A line segment has one endpoint at $(-2, 4)$ and a slope of 2. Find the coordinates of another possible endpoint by creating a triangle on your grid. Is there another answer that is also correct?



3) Determine the slope of the staircase shown below. To be considered safe, the slope should be between 0.58 and 0.70. Is this staircase safe?

