Slope

What is Slope?

Slope is a measure of the steepness of a line

Slope is the ratio of the rise to the run of a line or line segment

These lines look pretty different, don't they?

Lines are used to keep track of lots of info -- like how much money a company makes. Just off the top of your head, which of the lines above would you want to describe the profits of YOUR company? Whether the line is tilted up or down, all of the sudden, gets REALLY important!

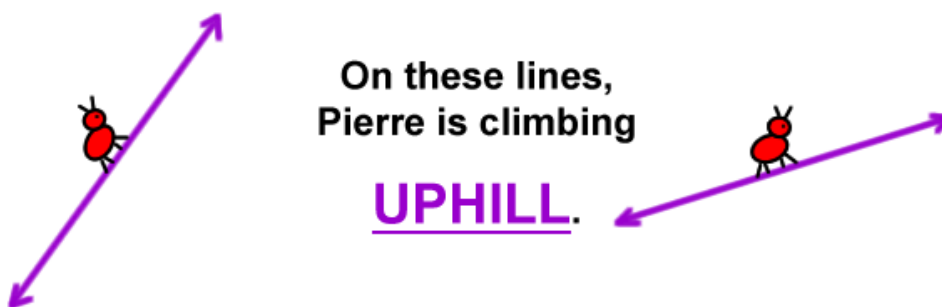**I am now going to introduce you to**
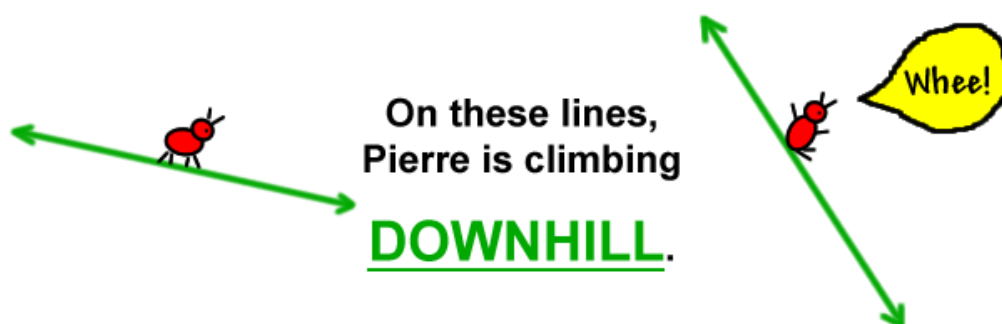
Pierre The Mountain Climbing Ant

(He's kind of a pathetic math super hero.)

For slopes, Pierre is going to walk on the lines from left to right
-- just like we read.

On these lines,
Pierre is climbing

UPHILL.

Uphill slopes are positive slopes.
The slope will be a positive number like 5 or 2/3.

On these lines,
Pierre is climbing

DOWNHILL.

Whee!

Downhill slopes are negative slopes.
The slope will be a negative number like -7 or -1/3.
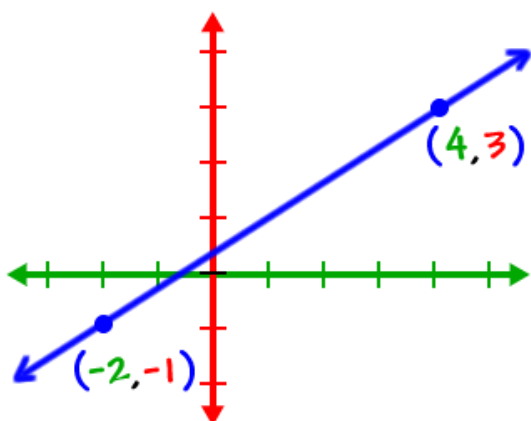
Calculating Slope

Aiden is a carpenter's apprentice. He needs
to check that the handrail is installed at the same
slope as the stairs. What should the slope of the
handrail be?

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

$$= \frac{8}{10}$$

$$= \frac{4}{5}$$

Let's look at the line going through the points

(-2,-1) and (4,3)

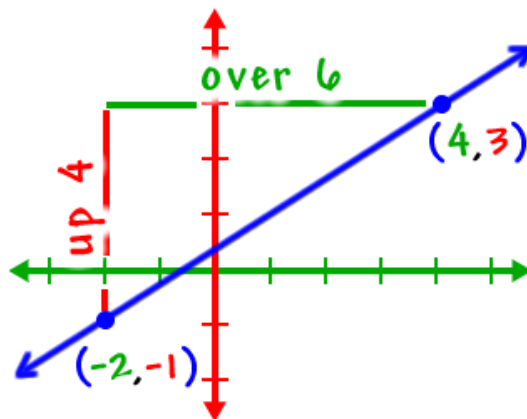The simplest way to look
at the slope is

$$\frac{rise}{run}$$

(rise over run)

***Always start at left point and go up or down first, then run to the right from there!!

To get from the point (-2, -1) to the point (4, 3), you rise up 4... and run 6.
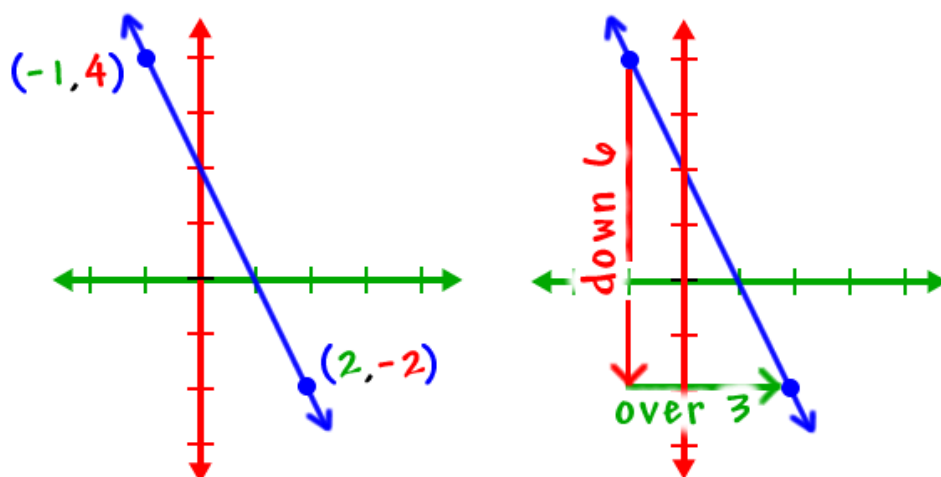
The slope is

$$\frac{rise}{run} = \frac{4}{6} = \frac{2}{3}$$

(Notice that the slope goes uphill and $\frac{2}{3}$ is a positive number)

For $\frac{rise}{run}$, you can "rise" up or down... but, you ALWAYS "run" to the right. ALWAYS!

$$\frac{rise \updownarrow}{run \rightarrow}$$

Check it out:

Let's find the slope of this line:

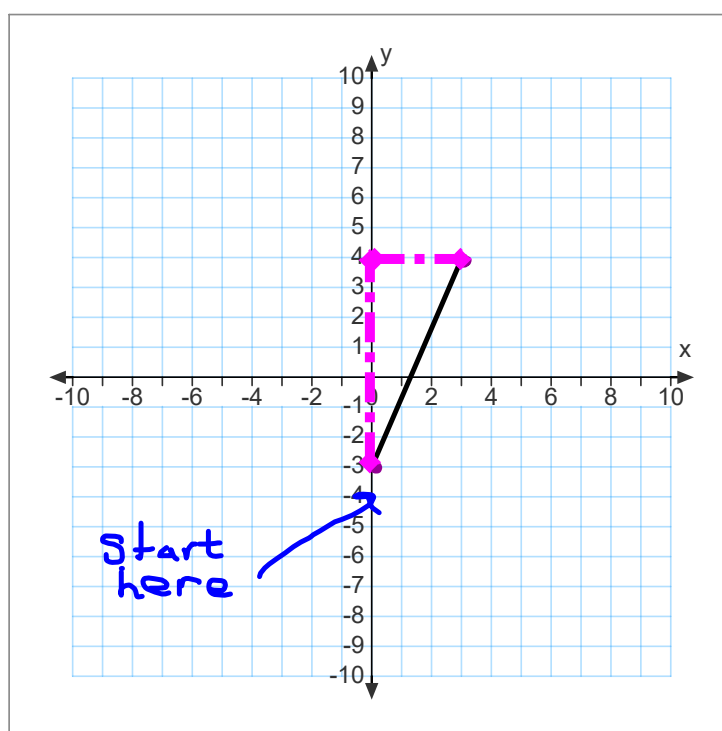$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{-6}{3} = -2$$

Negative -- and the line is going downhill

Graph the line that passes through the points

$(0, -3)$ and $(5, 4)$

Then, use the graph to find the slope.

$$\frac{rise}{run} = \frac{7}{3}$$

start
here

Using ratios and proportions

Suppose the slope of a line is 3:4 and the run is 12. What does the rise have to be?

$$\frac{rise}{run} \rightarrow \frac{3}{4} = \frac{x}{12}$$

$$x = \frac{3 \times 12}{4}$$

$$x = 9$$

A 42 inch TV is 36 inches wide. What is the slope of the diagonal.
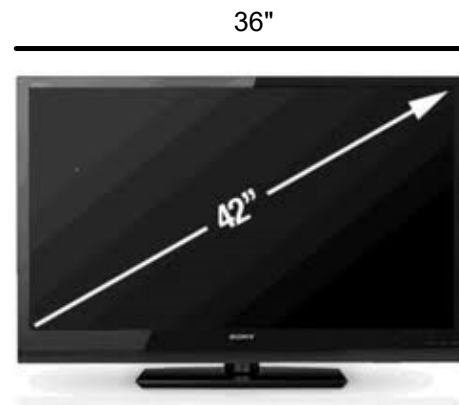HINT: Use Pythagorean Theorem

36"

42"

$$a^2 = c^2 - b^2$$
$$a^2 = 42^2 - 36^2$$
$$a^2 = 1764 - 1296$$
$$\sqrt{a^2} = \sqrt{468}$$
$$a = 21.6"$$

$$slope = \frac{rise}{run} = \frac{21.6}{36} = \frac{216 \div 72}{360 \div 72} = \frac{3}{5}$$