Look at $\frac{\text{rise}}{\text{run}}$ as

$\frac{\text{the change in the y's}}{\text{the change in the x's}}$

$= \frac{3-(-1)}{4-(-2)} = \frac{4}{6} = \frac{2}{3}$

Unit 5: Linear Equations

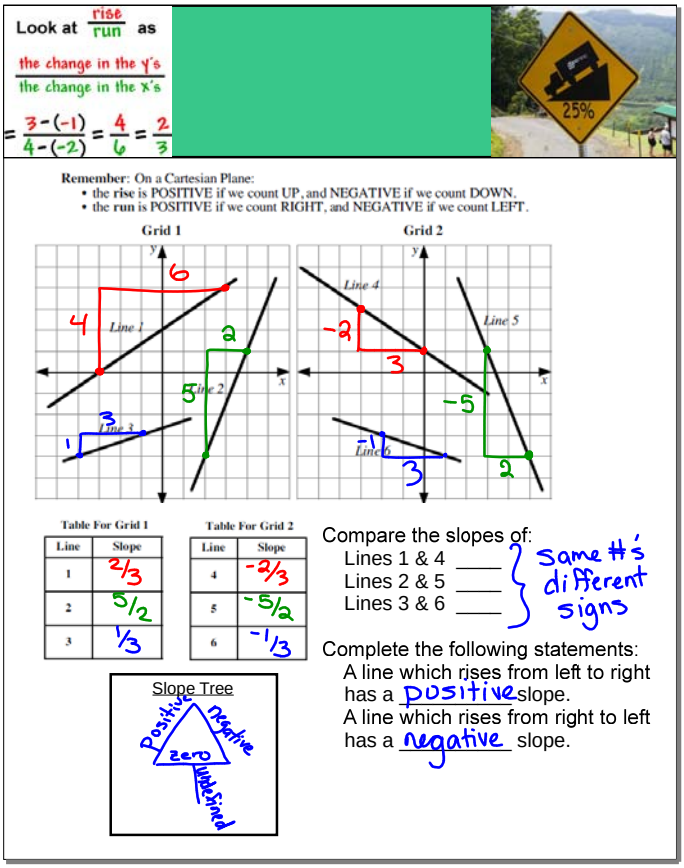
5.2 Slope as Rise Over Run

The slope of a line is a measure of the steepness of the line segment.

It is the ratio of **rise** (change of vertical height between endpoints) over **run** (change of horizontal length between endpoints.

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

The rise is positive if we count up and negative if we count down.
The run is positive if we count right and negative if we count left.



Look at $\frac{\text{rise}}{\text{run}}$ as

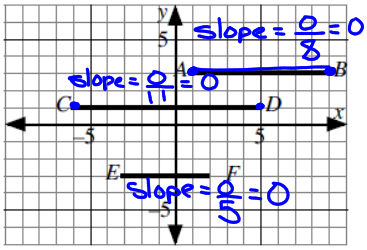
$\frac{\text{the change in the y's}}{\text{the change in the x's}}$

$= \frac{3-(-1)}{4-(-2)} = \frac{4}{6} = \frac{2}{3}$

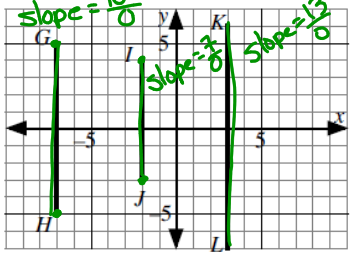
Investigation #2 *Slopes of Horizontal and Vertical Line Segments*

Consider the line segments in Grid 1 and Grid 2 below.

Grid 1



Grid 2



a) Determine the slopes of all the line segments in Grid 1. slope = 0

b) Determine the slopes of all the line segments in Grid 2. undefined

c) Complete the following statements.

- Horizontal line segments have a slope of zero.
- Vertical line segments have an undefined slope.

Look at $\frac{\text{rise}}{\text{run}}$ as

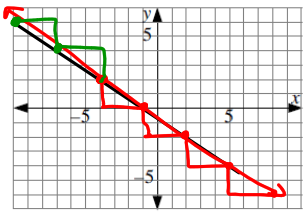
$\frac{\text{the change in the y's}}{\text{the change in the x's}}$

$= \frac{3-(-1)}{4-(-2)} = \frac{4}{6} = \frac{2}{3}$

Draw a line segment on the grid which passes through the point $(-4, 2)$ and has a slope of $-\frac{2}{3}$. The line segment must be long enough to cross both the x-axis and the y-axis.

Write the coordinates of three other points on the line segment which have integer coordinates.

$\frac{3}{3}$ $\frac{-2}{3}$



Ex.) How do you find a missing rise or run when given the slope of a line and either the rise or run?

$\frac{1}{2} = \frac{x}{14}$ $x = 7$

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

cross-multiply.

Ex.) A line segment has a slope of $\frac{-5}{7}$ and a rise of 12. Calculate the run as an exact value.

$\frac{-5}{7} = \frac{12}{x}$ $x = -16.8 = -\frac{84}{5}$

Look at $\frac{\text{rise}}{\text{run}}$ as

$\frac{\text{the change in the y's}}{\text{the change in the x's}}$

$= \frac{3-(-1)}{4-(-2)} = \frac{4}{6} = \frac{2}{3}$