

Remember: *slope* is a rate of change. The *slope* of a line is defined as the change in  $y$  divided by the change in  $x$

(i.e.  $\frac{\Delta y}{\Delta x} = \frac{y_1 - y_2}{x_1 - x_2} = \frac{y_2 - y_1}{x_2 - x_1}$  . )

- A vertical line has *No slope*.  
(The slope is undefined)
- A horizontal line has  $\text{slope} = 0$ .
- A line going up as it goes to the right has *positive slope*.
- A line going down as it goes to the right has *negative slope*.

**Forms of Linear Equations** (Lesson 39)

- Slope-intercept (y-form)**  $y = mx + b$
- General form**  $Ax + By + C = 0$
- Point-slope form**  $y - y_1 = m(x - x_1)$
- Double intercept form**  $\frac{x}{a} + \frac{y}{b} = 1$  , where  
 $a$  is the  $x$ -intercept and  $b$  is the  $y$ -intercept
- Two-point form**  $y - y_1 = \frac{y_2 - y_1}{x_2 - x_1} (x - x_1)$

Remember: A rational number is a number that can be written as a fraction of integers. Irrational numbers are numbers that can NOT be written as a fraction of integers. Irrational numbers include most roots,  $\pi$ , and  $e$ . A terminating (ending) decimal or a non-terminating repeating decimal are rational numbers, while non-terminating, non-repeating decimals are irrational. The root (square root, cube root, 4<sup>th</sup> root, etc) of any counting number that is not an integer is an irrational number. The even roots of a negative number will have an  $i$  which equals  $\sqrt{-1}$ . Those numbers are members of the set of imaginary numbers which is a subset of the set of complex numbers.

Remember:  $i = i, i^2 = -1, i^3 = -i, i^4 = +1, etc.$

To rationalize numbers that include square roots (radicals,  $\sqrt{\quad}$ ) you must be sure that there are:

- no perfect squares under the radical
- no fractions, nor decimals under the radical
- no radicals in the denominators

To rationalize numbers that include square roots or  $i$ 's in the denominators you must multiply the fraction by 1 in the form of the *conjugate* of the denominator divided by itself. A *conjugate* is the same binomial as the one you have, but with the opposite sign between the terms.