Linear Functions Basics

$$y = mx+b$$

The y = mx + b function is a formula that shows a straight-line relationship between two variables, "x" and "y".

It is used to model real-life situations where there is a linear connection between two things, like the distance traveled and time spent.

The formula for a Linear Function is:

y = mx + b

The simplest form is (graphed on the right):

y = 1x + 0 or $y = x$

What do the variables mean?

y = result of the function (output)

m = the rate of change (slope)

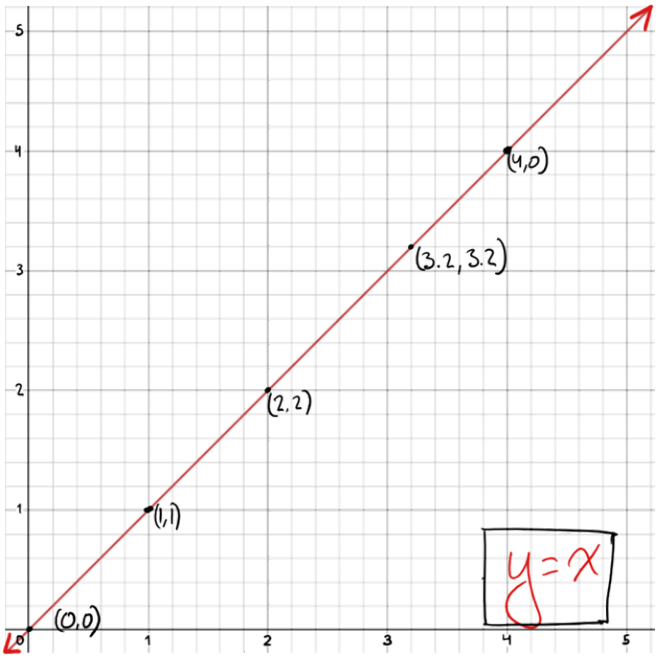
Ex. $\frac{5}{2}$ *or* $\frac{-2}{1}$

x = the number you plug in (input)

b = y-intercept

More on b**:**

- "b" is where the line crosses the y-axis
  - Changing the value of b shifts the graph up /down
- We can find b by setting x to zero
  - y = m(0) + b
  - y = 0 + b
  - y = b
- "b" is usually used as a starting point when plotting a graph



The above graph represents $y = x$ and shows the linear relationship between the value of x and y.

More on slope(m)**:**

- Slope is the steepness of a line
  - So a greater slope means a steeper line, and a lower slope means a less steep line
- Slope can be found using <u>rise over run</u> from any two different points, which is used to calculator the slope for one part of the function, which will represent the slope for the entire function
  - For example, if two points in a function are (4,2) and (0,1):
  - Slope = $\frac{Rise}{Run} = \frac{y_1-y_2}{x_1-x_2} \frac{2-1}{4-0} = \frac{1}{4}$

For More Details Refer to our other handouts:

- Linear Functions: Graphing
- Linear Functions: Finding Equation from points

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