MATH 101 CHEAT SHEET

This packet is not meant to go over everything that we have done in the course but rather to summarize a lot of information. In fact, you'll notice that I did not mention **composition and inverses of functions** here, yet I would highly recommend studying these. Please make sure to do the practice finals on canvas and in the workbook. **It is impossible to learn/understand math without doing math; this includes writing all your work down!**

1. Functions

(1) A **function** is a relationship between two variable in which every input has exactly one output.

(2) A function is generally written as $f(x)$, where x is our input variable and $f(x)$ is our output variable. As an example, we write $f(3) = 5$ to say that "when we plug in 3 into the function $f(x)$, the output is 5".

(3) The **domain** of a function is the set of values we are allowed to plug into the function. Think: the x-values we can plug in.

(4) The **range** of a function is the set of values we can get out of the function. Think: the y-values we can get out.

(5) The **average rate of a function** $f(x)$ **on the interval** $[a, b]$ is given by

$$\frac{f(b) - f(a)}{b - a}.$$

2. Types of Functions

(1) A **linear function** is a function of the form $y = mx + b$, where $m = \frac{\text{change in } y}{\text{change in } x}$ is the slope (average rate of change) of the line and $(0, b)$ is the $y-$intercept.

3. Linear Functions

(1) **Point-Slope Form:** Given a point (x_0, y_0) on a line with slope m, the equation of the line is $y = m(x - x_0) + y_0$.
(2) **Slope-intercept Form** A line with slope m and y-intercept $(0, b)$ is given by the equation $y = mx+b$.