MATH 2554 **Calculus I** **Fall 2019**

Drill Handout Sections 2.1 and 2.2 August 29, 2019 Name:_____

(1) For the position function $s(t) = \frac{12}{t+2}$, make a table of average velocities and make a conjecture about the instantaneous velocity at the time $t = 0$.

(2) For the function $f(x) = 5\sin x$, make a table of slopes of secant lines and make a conjecture about the slope of the tangent line at the point $x = \pi$.

(3) Sketch a graph of $f(x) = \begin{cases} x+1 & \text{if } x < 2 \\ 3-x & \text{if } x \geq 2 \end{cases}$ and use it to make a conjecture about the values of $f(2)$, $\lim_{x\to 2^-} f(x)$, $\lim_{x\to 2^+} f(x)$, and $\lim_{x\to 2} f(x)$ or state that they do not exist.

(4) Sketch the graph of a function with the given properties. You do not need to find a formula for the function.

$$f(1) = 2, \lim_{x\to 1^-} f(x) = 4, \lim_{x\to 1^+} f(x) = 2$$
$$\lim_{x\to 2} f(x) = 3, f(2) = 1.$$