Section 1.2

1) Evaluate the function $f(x) = \frac{x^2-3x+2}{x-1}$ at several points near $x = 1$ and use the results to estimate the limit

$$\lim_{x\to 1} \frac{x^2 - 3x + 2}{x - 1}.$$

Next, factor the numerator of $f(x)$ and then graph the function with a hole at $x = 1$ to graphically verify the limit you found.

2) Find the limit of $f(x)$ as x approaches 2 where f is defined as

$$f(x) = \begin{cases} \frac{1}{2}x + 1, & x \neq 2 \\ -1 \quad , & x = 2 \end{cases}$$

Graph the function first.

3) Graph the function

$$f(x) = \begin{cases} x + 1, & x < 0 \\ x - 1, & x > 0 \end{cases}$$

Does $\lim_{x \to 0} f(x)$ exist? If so, state the limit. If not, explain why not.

4) Graph the function $f(x) = \tan^2 x\,, -\pi < x < \pi$. Does $\lim_{x \to \frac{\pi}{2}} f(x)$ exist? If so, state the limit. If not, explain why not.

5) Find the limit L. Then find $\delta > 0$ such that $|f(x) - L| < 0.01$ whenever $0 < |x - c| < \delta$.

$$\lim_{x \to 2}(3x + 2)$$

6) Find the limit. Use the $\varepsilon - \delta$ definition to prove that the limit is L.

$$\lim_{x \to -3}(2x + 5)$$

Homework for this section: Read section 1.2. Watch the videos (marked with  in the e-book) and do the tutorials (marked with  in the e-book).

Do problems 3, 11, 17, 22, 23, 25, 27, and do #38 for a challenge. Come to class with at least two questions related to what you read/watched.