## Calculus 1 - Outline for Exam 1

## Main ideas

A. Limits (one-sided, two-sided, and at infinity) and connection to asymptotes
B. Continuity

## Skills you should have

1. Be able to compute limits and determine is a function is continuous from a graph.
2. Be able to compute limits and determine is a function is continuous numerically (by plugging numbers into a function and studying the outputs).
3. Be able to compute limits and determine is a function is continuous algebraically.

- Be able to "simplify" limits if direct substitution yields something indeterminate. Remember that the techniques to "simplify" are different if you are computing a limit as $x \rightarrow a$ versus $x \rightarrow \infty$.
- Be able to work with piece-wise defined functions.

4. Be able to determine the vertical and horizontal asymptotes of a function.
5. Be able to state the definition of a function being continuous at $a$, which is that (1) $f(a)$ exists, (2) $\lim _{x \rightarrow a} f(x)$ exists, and (3) $\lim _{x \rightarrow a} f(x)=f(a)$.

## How to study

I. Review core topics
II. Work lots of problems all of the way through-focus on WeBWorK problems and Worksheet problems
III. Practice doing several problems in a short amount of time (by timing yourself)
IV. Come talk with me if you have any questions

