Things You Should Know For the First Exam

Exam covers 1.4-1.6, 1.8, 3.4

1) Limits

- The idea of a limit, limit from the left, and limit from the right; how to tell if any of these exist by looking at a graph. You do NOT need to know the precise definitions involving epsilons.
- The limit laws: know them! In particular, be able to tell when something is NOT a limit law!
- How to algebraically manipulate expressions of the form $0/0$ in order to find a limit (using factorization, common denominators, etc.)
- Vertical and Horizontal Asymptotes: how to find them and what they mean for a graph. For vertical, know that these exist whenever you see a limit of the form $x/0$ where $x \neq 0$.
- Limits to Infinity: be aware of the conjugation trick when you have $\infty - \infty$. You may freely use the result that $\lim_{x \to \pm\infty} \frac{1}{x} = 0$. You do NOT need to know the precise definitions involving epsilons.
- Infinite Limits: be able to distinguish whether a limit (from the right, from the left, or in general) is infinity, negative infinity, or does not exist. You do NOT need to know the precise definitions involving epsilons.
- The Squeeze Theorem: know how to state it and in what situations it applies (usually sines and cosines are involved)

2) Continuity

- Know the definition.
- Determine where an (algebraically given) function is continuous- especially a piecewise-defined one!
- Be able to check continuity from a graph.
- You may use the fact that a polynomial is continuous on all real numbers and a rational function is continuous wherever it is defined.

3) Any and all algebra and trigonometry that you have ever learned (minus some of the weirder trig identities).