Chapter 1 Review Topics:

1. Memorize and be able to write the definition of continuity at a point (the 3 requirements).
2. Use the above definition of continuity to **prove** whether or not a function is continuous at a given point.
3. Types of discontinuities: removable/point, jump, and infinite.
4. Find discontinuities given a function or recognize and name discontinuities from a graph.
5. Find vertical asymptotes and/or holes given a rational function.
6. Find limits, if possible. Use direct substitution whenever possible. Show evaluation (required work).
7. When indeterminate (0/0), find limits using algebraic strategies (factoring, multiplying by conjugate, or simplifying to cancel a common factor from numerator and denominator) or use a graph. The graph or the algebraic strategy demonstrated is the work that is required.
8. Find limits from the left (x -> c-), from the right (x -> c+), and as x -> c (both limits from left and right must be the same for the limit to exist as x -> c).
9. Know the behavior that results in a limit that does not exist: Unbounded (asymptote), different from the left and the right, and oscillation.
10. Use special trig limits and properties of limits to find a limit involving trigonometry. Must show all steps to demonstrate how you are using the special trig limits and properties of limits to get your answer.
11. Find infinite limits (limits that evaluate to a constant divided by zero if direct substitution is used). No work necessary, but you may want to consider using a table or a graph to help you decide if the limit is infinity, negative infinity, or DNE. Remember that if specified from left or right only, answer will be either infinity or negative infinity, **not** DNE. If not specified left or right, then answer could be infinity (if same from both sides), negative infinity (if same from both sides), or DNE (if different from both sides).
12. Use Intermediate Value Theorem (I.V.T.) to prove there exists some c on the closed interval [a, b] such that f(c) = k, where f(x), [a, b], and k are given. Must show two requirements before the theorem can be used to make your conclusion: f(x) is continuous on [a, b] and k is between f(a) and f(b). Make sure your reasoning is clear and complete. Be explicit. I should not have to interpret your work.