BC: Chapter 1 Review Topics:

1. Use the definition of continuity at a point (the 3 requirements) to **prove** whether or not a function is continuous at a given point.
2. Types of discontinuities: removable (point), jump, and infinite.
3. Find discontinuities given a function or recognize and name discontinuities from a graph.
4. Find vertical asymptotes and/or holes given a rational function.
5. Find limits, if possible. Use direct substitution whenever possible. Show evaluation (required work).
6. 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.
7. 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).
8. Know the behavior that results in a limit that does not exist: Unbounded (asymptote), different from the left and the right, and oscillation.
9. Know the Sandwich (Squeeze) theorem and how to apply it to prove that a limit exists for some function as x approaches some given value. See pg. 113 example 9 and pg. 115 problems 61 and 63.
10. 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).
11. 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.