Exam 1 Topic List

**The Limit of a Function**

* Determine one- and two-sided limits using graphs and tables
* Understand and identify the three cases where limits fail to exist

**Finding Limits by Limit Laws**

* Apply limit laws (sum and difference, constant multiple, etc.)
* Apply the following analytic methods to evaluate limits: direct substitution, cancellation, rationalization, common denominator, Squeeze Theorem
* Re-write an absolute value function in piecewise form and evaluate one- and two-sided limits using appropriate parts of the piecewise function

**Limits Involving Infinity**

* Identify vertical and horizontal asymptotes and define each using limits
* Understand and apply legitimate operations for limits involving infinity: constant operations, , and 
* Evaluate limits of the forms  and 
* Evaluate limits of the form , where *c* is a non-zero real number

**Continuity and IVT**

* Understand the limit definition of continuity at a point
* Identify discontinuities by the three classifications: *removable*, *jump*, *infinite*
* Understand and apply the Intermediate Value Theorem (IVT) for both closed-form functions and alternate representations (e.g., tables, graphs, etc.)

**Rates of Change and Differentiation**

* Approximate derivatives using tables
* Approximate/evaluate derivatives using graphs
* \*\* Don’t forget squiggly equal marks () when approximating \*\*
* Understand and identify the three cases where a function will be non-differentiable at a point
* Sketch the graph of the derivative of a function given the graph of the function
* Apply the *limit definition of the derivative* to find instantaneous rates of change as a function and at a point, and to find tangent lines