Math 261
Exam 1 Review Sheet

Section 1.1 Algebra Review

- Equations of lines, parallel and perpendicular lines, x and y - intercepts
- The distance formula
- Absolute value, equations and inequalities involving absolute value
- Solving inequalities algebraicially, sign testing

Section 1.2 Functions Review

- The definition of a function, finding domain and range, the vertical line test
- Graphing functions, interpreting the graph of a function
- Interval notation, increasing and decreasing intervals
- Combinations of functions (sum, difference, product, quotient, composition)
- Piecewise defined functions
- graph symmetries, even and odd functions, shifts of functions and their graphs

Section 1.3 Trigonometry Review

- Degrees, radians, and arc length
- Solving right triangles, the definition of the basic trig functions
- Graphs of trig functions
- solving trig equations, trig identities

Section 2.1 Into to Limits

- The intuitive idea of a limit
- Investigating limits using tables of values
- One - sided limits
- Finding limits from graphs
- Finding limits of piece-wise defined functions
- Finding limits using algebra

Section 2.2 Definition of Limit

- *Memorize* the definition of a limit
- Given a function and a specific ϵ value, finding a δ value
- Proving a limit value using the definition
- Proving a limit does not exist

Section 2.3 Techniques for Finding Limits

- Limits of $f(x) = c$ and $f(x) = x$
- Properties of limits - the limit of combinations of functions
- Limits of polynomial, rational functions, and roots of functions
- The Sandwich Theoem

Section 2.4 Limits Involving Infinity

- Computing limits as $x \to \pm\infty$ (algebraic methods)
- Expressing one and two sided limits where the function goes to $\pm\infty$
- The formal definition of $\lim\limits_{x\to\infty} f(x)$ and $\lim\limits_{x\to-\infty} f(x)$
- Using limits to find the vertical and horizontal asymptotes of a function

Section 2.5 Continuous Functions

- The definition of continuity of a function at a point $x = c$
- Classfying points of discontinuity: removable, jump, and infinite discontinuities
- Continuity on intervals: (a, b) and $[a, b]$
- Continuity of combinations of functions, polynomials, and rational functions
- Finding the points of discontinuity of a given function
- The Intermeduate Value Theorem: statement and applications.