Objectives for Exam #1

A well-prepared student for Exam #1 should be able to

- state the definitions of the negation, conjunction, disjunction, implication, and equivalence of logical statements p, q
- construct truth tables of more complex logical statements
- understand and use set notation
- state the definitions of the union and intersection of sets
- draw Venn diagrams for sets defined by intersections and unions
- articulate the meaning of "function" in terms of cartesian products of sets
- express the meaning of $\{x \in \mathbb{R} : |x - a| \leq r\}$ as a set and as an interval or union of intervals
- express the meaning of $\{x \in \mathbb{R} : |x - a| > r\}$ as a set and as an interval or union of intervals
- express the geometric meaning of $|x - a| > r$
- write the equation of a circle with a given radius and center
- articulate how to express the equation of a vertical translation or scaling of a graph of a function
- articulate how to express the equation of a horizontal translation or scaling of a graph of a function
- recognize linear, quadratic, polynomial, rational, trigonometric, and exponential functions
- be able to complete the square on a quadratic function
- use correct terminology for linear, quadratic, polynomial, rational, trigonometric, and exponential functions
- state and use basic trigonometric identities
- state the values of the trigonometric functions for "standard" angles in any quadrant
- understand and be able to use the properties of exponential and logarithmic functions
- know when a function has an inverse function
- be able to use inverse functions to solve equations
- state the definitions of $\sinh(x)$ and $\cosh(x)$ and the fundamental identity relating them to each other
- verbalize the difference between the value of a function f at an input a and what the function f "ought to be" at the input a
- given a specific function f and number a, make a convincing argument that: given any "error", there is a "tolerance" for which if $x = a \pm$ (tolerance), then $f(x) = L \pm$ (error)