Exam 1 Review Guide

Chapter 0

0.1

–Know interval notations
–Be able to add/subtract/multiply/divide fractions
–Be comfortable graphing points on the Cartesian plane

0.2 : Functions

–Function is a rule that assigns at most 1 output for every input
–Understand how to write functions based on word description
–Be able to evaluate functions at different values
–Know independent vs. dependent variable
–Remember, $f(x)$ gives a y-height on the graph
–Find natural domains
    -Recall that we look for numbers that are NOT in the domain
    -Everything else will be in the domain
    -There are two rules to see if something is not in the domain
        -We cannot divide by 0
        -We cannot take the square root of a negative
        -Find problem points by setting up equalities/inequalities: solve
–Vertical Line Test-be able to use it to determine if a curve is a function

0.4 : Linear Functions

–$f(x) = mx + b$, m is slope, b is y-intercept (slope intercept form)
–$y - y_1 = m(x - x_1)$ (point slope form)
–Find equations of lines given either two points, or one point and slope
–Cost Functions, Revenue Functions, Profit Functions
–Supply and Demand Curves

0.5 : Quadratic Functions

–$f(x) = ax^2 + bx + x$
–Know how to find roots, either factoring or using quadratic formula
–We factor in order to find x-intercepts, i.e x-values which output 0.
–Know how to find vertex of quadratic
–Be able to graph a quadratic. (find vertex, pointing up or down, etc)
–Know whether the vertex is the minimum or maximum of the range

0.6 : Polynomials, Rational Functions, Power Functions

–Understand behavior of polynomials for x-values of large absolute value
    -What happens to the graph as x gets large positively or large negatively
–Know where rational functions are defined (Find vertical asymptotes and holes)
–Be able to calculate things of the form $a^{\frac{p}{q}}$

Chapter 1

1.1 : Limits

–Know the informal definition of the limit and what it means: $\lim_{x \to a} f(x) = L$

–Fact: $\lim_{x \to a} x^n = a^n$

–Use the above and know the limit laws to evaluate limits of functions

    -Plug in the value if you can. If you can't you must do more work.

–Be able to find limits where function has a hole

–Know how to find one sided limits (particularly when $\lim_{x \to a} f(x)$ DNE)

–Know that $\lim_{x \to a} f(x)$ exists if and only if the one sided limits are equal.

–Remember, if all else fails, use a table of values close to $x = a$

1.2 : More Limits and Asymptotes

–Be able to find limits at vertical asymptotes (Using values close to $x = a$ on both sides)

–Understand $\lim_{x \to \pm\infty} f(x)$ is a horizontal asymptote

–Be able to find horizontal asymptotes of rational functions

    -Only depends on term with largest power of x in numerator & denominator

1.3 : Continuity

–Know the definition of continuity, be able to explain it in your own words

–Find discontinuities of a function based on the graph, or the formula

–Understand the idea of the Intermediate Value Theorem

–Use the IVT to know in which intervals roots occur based on a table of values.