MAT 113, Final Exam Concepts

You should know how to do the following. The section number is given in parentheses at the end. You will also be responsible for the same material as was on Tests 2 and 3. It is not listed here, to shorten the list.

- Recognize when an expression is a polynomial (5.1)
- Sketch the graph of a monomial (5.1)
- Determine the end behavior of a polynomial (5.1)
- Know how to divide a polynomial by a polynomial of the form $x + a$ or $x - a$, using long division and synthetic division. (You do NOT need to know how to divide a polynomial by anything other than $x \pm a$.) (5.2)
- Use the Rational Root (Zero) Test (5.3)
- Find the roots (zeros) of a polynomial. This means using the Rational Root Test, dividing by $x - r$, where $r$ is a rational number, and possibly solving a quadratic equation to determine what the other roots are. (5.3, 5.4)
- Know the Fundamental Theorem of Algebra, and know what multiplicity is (5.4)
- Given a rational function, find any vertical or horizontal asymptotes it may have, and the $x$-intercept(s) and $y$-intercept(s) (5.5)
- Recognize when an expression is an exponential function (6.1)
- Sketch the graph of an exponential function (6.1), as well as perform transformations on it (related to 4.5)
- Know what the number $e$ is (6.2)
- Know the formulas for compound interest, when compounded $N$ times per year, and when compounded continually (6.2)
- Be familiar with a basic formula for exponential growth (6.2)
- Convert between the exponential form and the logarithmic form of an equation (6.3)
- Sketch the graph of a logarithmic function (6.3, and 4.5 for transformations)
- Be able to evaluate $\log b 1$, $\log b b$, $\log b b^x$, $b^{\log b x}$ without a calculator (6.3)
- Know what is meant by the common logarithm ($\log x$) and the natural logarithm ($\ln x$) (6.3)
- Know the basic laws of logarithms: multiplication, division, and exponents (6.4)
- Know the change of base formula, so that you can approximate a logarithm using your calculator (6.4)