Math 262
Exam 5 Review Sheet

Section 10.8 Taylor and Maclaurin Series

- Be able to find a Taylor Series (or Maclaurin) for a given function using direct computation.
- Be able to find a Taylor polynomial of order n for a given function.
- Be able to use a Taylor polynomial to approximate the value of a function for a specific input.

Section 10.9 Convergence of Taylor Series

- Know the statement of Taylor's Theorem.
- Understand how to apply Taylor's Formula to find the remainder term of a Taylor (Maclaurin) Polynomial of order n.
- Be able to use either the remainder term or the Alternating Series Error Theorem to find an upper bound on the error when approximating a function using its nth Taylor (Maclaurin) polynomial.
- Be able to approximate a specific quantity using a Taylor (Maclaurin) polynomial and be able to find a upper bound on the error in this approximation. Also be able to find the maximum error when using a Taylor Polynomial to perform approximations on an interval of values (provided the interval is a subset of the interval of convergence of the Taylor Series).
- Be able to determine how many terms are necessary to use a Taylor Polynomial in order to approximate the value of a function to a specified degree of accuracy.

Section 10.10 The Binomial Series and Applications of Taylor Series

- Know the definition of the Binomial series and be able to use it to find a series representation for $f(x) = (1 + x)^m$ for a specific value of m.
- Be able to use a binomial series to expand an expression of the form $(a + bx)^n$
- Memorize the Maclaurin series representations of the functions: $\frac{1}{1-x}$, $\frac{1}{1+x}$, e^x, $\sin x$, and $\cos x$.
- Be able to find power series representations of other functions by starting with a known power series and then using substitution, differentiation, integration, and/or multiplying by a power function.
- Be able to approximate the value of a function, the value of a definite integral, or compute the value of a limit by using power series representations. Also be able to bound the error in approximations.

Section 11.3, 11.4 Polar Coordinates, Graphing in Polar Coordinates

- Understand the definition of the polar plane and be able to plot points in terms of (r, θ) coordinates.
- Memorize the conversion equations between rectangular and polar coordinates and be able to translate polar equations into rectangular form and rectangular equations into polar form.
- Be able to accurately sketch the graph of various polar equations, indicating the orientation of the polar curve in the plane and labeling key points on the graph. It would be a good idea to familiarize yourself with the standard polar graphs and their equations on the polar graphing handout.
- Be able to recognize whether or not a given polar curve is symmetric with respect to the x-axis, y-axis, and origin.

Section 11.5 Area in Polar Coordinates

- Be able to set up and evaluate integrals representing the area within an enclosed polar region
- Be able to set up and evaluate integrals representing the area either within or between two polar curves.