

MAT 162-003 and MAT 162-300
Main Topics for Test 5
Wednesday, April 25, 2012

(Sections 11.8 through 11.10, and 9.1 through 9.4)

Power Series

Be able to :

- find the interval of convergence and radius of convergence of a power series
- find the sum of a geometric power series
- write a given function as a power series by:
 - using the geometric series formula
 - differentiating a known power series
 - integrating a known power series

Taylor and Maclaurin Series

Be able to:

- find the first few terms of the Taylor series for $f(x)$ at $x=a$ (or Maclaurin series, where $a=0$)
- approximate the error in using a Taylor polynomial to approximate a function at a point by:
 - the Alternating Series Estimation Theorem
 - Taylor's remainder formula
- use short cuts for finding Maclaurin series, including the use of basic Maclaurin series for $\sin x$, $\cos x$, and e^x

Differential Equations

Be able to:

- verify that a given family of functions are solutions to a given differential equation
- solve separable differential equations, including initial value problems
- find orthogonal trajectories
- solve mixing problems
- solve population growth problems, including the logistic equation