

## 242 - Differential Equations: Test 5 Study Guide

Henson - Summer 09

TEST 5 TOPICS:

### Chapter 8 -

1. Create a polynomial of degree  $n$  that approximates the solution to a DE around  $x = c$ .
2. Compute the Radius of Convergence for a series (uses the Ratio Test - review: Calc II).
3. Compute the Interval of Convergence (uses the Ratio Test - review: Calc II).
4. Determine the convergence of the endpoints of the interval of convergence (uses convergence tests from Calc II).
5. Manipulate the terms in a series (adjust powers of  $x$ , adjust the initial values of the index, etc.).
6. Differentiating the terms in a series.
7. Substituting a series into a DE.
8. Identify patterns in a recurrence relation. (helps determine the coefficients  $a_n$  for the power series)
9. Find a general solution to a DE using power series.

\* Skip any problems dealing with *ordinary points* or *singular points*.

## Chapter 9 -

10. Know all basic matrix algebra: addition, subtraction, multiplication, scalar multiplication.
11. Compute the determinant of a  $2 \times 2$  matrix by hand.
12. Convert a system into an equation using matrices.
13. Find the eigenvalues of a matrix.
14. Find the eigenvectors of a matrix.
15. Write a characteristic equation.
16. Write the solution to a system of D.E.'s using eigenvalues and eigenvectors.
17. Know how to handle distinct and repeated eigenvalues.
18. Solve a system of D.E.'s if there are initial conditions present.