Math 341 Spring 2005

Quiz **6** **Differential Equations**

Name: _____

Time Begun: _____ **Friday March 4**
Time Ended: _____ Ron Buckmire

Topic : Linear, n^{th} Order, Nonhomogeneous, Differential Equations

The idea behind this quiz is to provide you with an opportunity to illustrate your understanding of solution techniques for n^{th}-order nonhomogeneous ordinary differential equations.

Reality Check:

EXPECTED SCORE : _____/10 ACTUAL SCORE : _____/10

Instructions:

0. Please look for a hint on the course website at `http://faculty.oxy.edu/ron/math/341/` in the News section.
1. Once you open the quiz, you have **30 minutes** to complete it, please record your start time and end time at the top of this sheet.
2. You may use the book or any of your class notes. **You must work alone.**
3. If you use your own paper, please staple it to the quiz before coming to class. If you don't have a stapler, buy one.
4. After completing the quiz, sign the pledge below stating on your honor that you have adhered to these rules.
5. Your solutions must have enough details such that an impartial observer can read your work and determine HOW you came up with your solution.
6. Relax and enjoy...
7. **This quiz is due on Monday March 7**, in class. NO LATE QUIZZES WILL BE ACCEPTED.

Pledge: I, _____, pledge my honor as a human being and Occidental student, that I have followed all the rules above to the letter and in spirit.

Math 341 Spring 2005 **SHOW ALL YOUR WORK** Quiz **Six**

1. Consider the linear third-order differential equation $Ly = g$,

$$\frac{d^3y}{dx^3} - y = e^x + 7$$

(a) *3 points.* Write down the auxiliary equation and show that the homogeneous solution y_h which solves $Ly_h = 0$ is $y_h(x) = c_1e^x + c_2e^{-\frac{x}{2}}\cos(x\frac{\sqrt{3}}{2}) + c_3e^{-\frac{x}{2}}\sin(x\frac{\sqrt{3}}{2})$

(b) *2 points.* Write down the general (undetermined) form of the particular solution $y_p(x)$

(c) *5 points.* Use the method of undetermined coefficients to obtain the complete general solution of the differential equation.