March 19,2012

Test♯1 Math202, sec 11

Net Time Allowed: 45 minutes

Name: **ID ♯ :** **Serial:**

Exercise1:

1)-Verify that $y = c_1e^t \sin 2t + c_2e^t \cos 2t$ is a two-parameter family of solution of the (DE):

$$y'' - 2y' + 5y = 0$$

2) Determine whether a member of the family can be found that satisfies the boundary conditions:

a) $y(0) = 1,\ y(\pi) = -1$ b) $y(0) = 1,\ y\left(\frac{\pi}{4}\right) = 2$

Exercise2:

Consider the DE:

$$y'' + 3y = -18e^{8x}$$

1. Verify that $y_1 \cos\sqrt{3}x$ and $y_2 = \sin\sqrt{3}x$ are solution of the DE: $y'' + 3y = 0$
2. Find a particular solution of the DE (1)
3. Form a General solution of the DE (1)

Exercise3:

Consider the differential equation:

$$x^2y'' - xy' + 2y = 0 \qquad (1).$$

(a) Verify that $y_1(x) = x\cos(\ln x)$ is a solution of the differential equation (1).
(b) Use the **reduction of order** to find a second solution $y_2(x)$ of the differential equation (1).

Exercise4:

Find the general solution of the differential equation:

$$y^{(4)} + 6y'' + 9y = 0$$