Math 202 Quiz 2

- The duration of the test is 1 hour

- No calculators are allowed

NAME:—————————————————————   SECTION:—————

1. (25 points) Find the solution of the following initial value problem using the method of undetermined coefficients

$$y'' - 2y' + y = te^t + 4, \quad y(0) = 1, y'(0) = 1.$$

2. (25 points) Determine the general solution of the differential equation

$$(x + 7)^2 y'' + 4(x + 7)y' + 2y = 2(x + 7)^2 e^{(x+7)}$$

3. (25 points) Determine the lower bound for the radius of convergence of series solution of the following differential equation about $x_0 = 0$. Solve it by means of power series $\sum_{n=0}^{\infty} c_n x^n$. Find the recurrence relation; also find the first three terms in each of the two linearly independent solutions.

$$(3 - x^2)y'' + 3xy' - y = 0$$

4. (25 points) Determine the singular points of the given differential equation and show that it is regular. Solve the differential equation using the power series solution using $\sum_{n=0}^{\infty} c_n x^{n+r}$ by finding first three terms of each solution.

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