Math 115 Exam #4 Practice Problems

1. Solve the initial-value problem

$$y'' + 8y' + 16y = 0, \quad y(0) = 3, \quad y'(0) = 6.$$

2. Solve the differential equation

$$y'' + 2y' + 37y = 0.$$

3. Solve the initial-value problem

$$y'' + 5y' - 24y = 0, \quad y(0) = 0, \quad y'(0) = 3.$$

4. Solve the differential equation

$$y'' + 9y = e^{2x}.$$

5. Solve the differential equation

$$y'' + 5y' + 6y = x^2$$

6. Solve the differential equation

$$y'' + 6y' + 9y = 1 + x$$

7. Use power series to solve the differential equation

$$y'' + xy' + 2y = 0.$$

8. Use power series to solve the differential equation

$$y' = 4x^2 y.$$

[*Hint*: your solution should be the power series of some recognizable function.]