MATH 3430-02 QUIZ 8

Name: _____

(This Quiz is worth 4 pts towards your final. **Due Wed. 03/20**.)

1. Find the power series solution of the initial value problem

$$y'' + \frac{x}{1+x^2}y' - \frac{1}{1+x^2}y = 0, \qquad y(0) = 1, \quad y'(0) = 1.$$

In particular, you need to present

(1) A recurrence relation of the coefficients in your power series;

(2) An interval on which your series solution is guaranteed to converge.

2. Solve the Euler equation

$$2t^2y'' + 5ty' + y = 0, \qquad t > 0.$$

(If you are using any formula, please make sure you're using it correctly.)

3. Use the method of *Laplace transform* to solve the initial value problem

$$2y'' + y' - y = 0, \qquad y(0) = 2, \quad y'(0) = 0.$$