Math 242, 1990, Exam 2

There are 4 problems. Use your own paper. SHOW your work. CIRCLE your answer. Each problem is worth 25 points.

1. Find the general solution of $yy'' = (y')^2$.

2. Find the general solution of $x^2y'' - xy' + y = 0$.

3. Find the general solution of $y'' + 2y' + y = xe^{-x}$.

4. The Initial Value Problem

$$x'' + 2x' + 5x = 0, \quad x(0) = 2, \quad x'(0) = 4\sqrt{3} - 2$$

   describes the motion of a spring. Solve the problem and put your solution in the form

$$x(t) = Ce^{-pt}\cos(\omega t - \alpha).$$