MA 266 Spring 2001 HW 5 Handout NAME: _____

1. Consider the initial value problem $y' = x^2y - xy^2,\ y(2) = 3$.

(a) Evaluate $y'(2)$.

(b) Is the solution increasing or decreasing near $x = 2$?

(c) Evaluate $y''(2)$.

(d) Is the solution concave upward or concave downward near $x = 2$?

(e) Are the Euler tangent line approximations of the solution near $x = 2$ greater than or less than the values of the solution?

2. Find the first three nonzero terms of the Maclaurin series of the solution of the initial value problem $y' = xy,\ y(0) = 1$.

3. Find the first four nonzero terms of the Maclaurin series of the solution of the initial value problem $y'' - 2y' + y = 0,\ y(0) = 0,\ y'(0) = 1.$

4. Find the first four nonzero terms of the Taylor series about $c = 1$ of the solution of the initial value problem $y' = y^2,\ y(1) = 1.$