January 16, 2001

Name: ____________________________

Quiz 1

1. (5 pt each) State the order of the differential equation and whether the given equation is linear or nonlinear. If the equation is nonlinear then circle the term(s) which makes the equation nonlinear.

(a) \( e^x y'' = x^2 y' + 3xy + \tan x \)

(b) \( x''' = (x + 1)x'' + tx' + x \)

2. (10 pt) Verify that the function \( y(x) = -7 \cos(6x) \) is the solution of the initial value problem

\[ y'' + 36y = 0, \quad y(0) = -7. \]

3. (10 pt) Solve the initial value problem.

\[ x^2y' + 2xy = x^5 + 1, \quad x > 1, \quad y(1) = -1. \]