MATH 231. QUIZ 1 (20 MINUTES)

Name: _____

Instructions: Read each problem carefully. You must show your work on solving ODE.

Problem 1 (10 points): Parts (a) (b) (c) are independent.

(a) (3 pts) Is the following ODE a linear one? or a nonlinear one? (Just answer linear or nonlinear.)

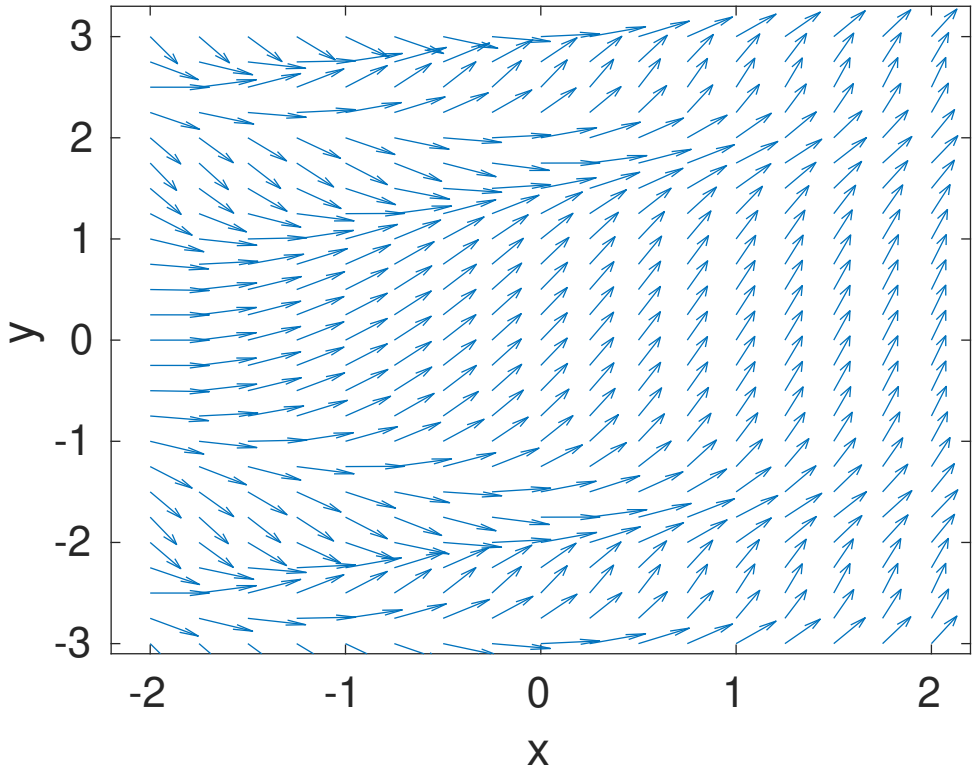
$$-2y'' + 2\cos(x)y - 3x = e^x y.$$

(b) (3 pts) What is the order of the following ODE? (Just answer, no need for explanations.)

$$y^3 - y'y + \cos(x) = x^6.$$

(c) (4 pts) Trace the solution to the following IVP on the direction field.

$$\frac{dy}{dx} = x + \cos(y^2) + 1, \quad y(-1) = 0.$$



Problem 2 (10 points): Solve the separable ODE below (remember to find the constant solution)

$$e^t \frac{dy}{dt} = \frac{y}{2y+1}.$$