

MATH 240 SPRING 2015

EXAM 1

Problem 1. (4 pts)

Your name:

Recitation instructor name:

Recitation time:

Problem	1	2	3	4	5	6	7	Total
Grade								

Problem 2. (16 pts) Solve the initial value problem

$$\frac{dy}{dx} = 3y + 2x, \quad y(0) = 0.$$

Problem 3. (16 pts) Solve the initial value problem

$$\frac{dy}{dx} = \frac{\sin x - y}{x - \cos y}, \quad y(0) = 0.$$

Problem 4. (16 pts) Solve the initial value problem

$$\frac{dy}{dx} = \frac{2x + 4y}{3x + y}, \quad y(1) = 1.$$

Problem 5. (16 pts) Solve the initial value problem

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

Problem 6. (16 pts) Solve the initial value problem

$$\frac{dy}{dx} = \frac{3x^2 + 2xy}{y^2 - x^2}, \quad y(1) = 2.$$

Problem 7. (16 pts) Find and classify (as stable, unstable or semi-stable when $t \rightarrow \infty$) all the equilibria of the equation

$$\frac{dy}{dx} = 6y - y^2 - y^3.$$