

Math 202(X02) Practice Midterm Exam Nov. 5, 2003

Note: Actual Midterm Exam is Monday evening, Nov. 10, in Clapp 224

You may have one handwritten sheet of notes, otherwise CLOSED BOOK.

Problem 1. Solve the initial value problem:

$$\frac{dP}{dt} = 0.2P, \quad P(1) = 10 \quad (1)$$

Problem 2. Solve the initial value problem:

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

Problem 3. Sketch a phase portrait (direction field) and a few qualitative solutions, including the one through (0,0), for the ODE

$$\frac{dy}{dx} = y - x^2 \quad (3)$$

Problem 4. Find the general solution to the ODE in Problem 3.

Problem 5. Use Euler's method to take 2 steps approximating a solution to the ODE in Problem 3, with initial value  $y(0)=0$ . Use  $\Delta x = 1$ .