

Exam #1, Feb 11, 2013  
Math 527, University of New Hampshire

Name:  
Section:

**INSTRUCTIONS: PLEASE READ CAREFULLY**

1. Write your name and section number above. 5 pts will deducted if either is missing or illegible.
2. Show your work and put a box or circle around your answers.
3. Always write equations.
4. Partial credit will be given only if your work is written clearly and in equations.

**Problem 1.** (30 pts) Find the general solution of the differential equation. Solve for  $y(x)$  explicitly.

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

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**Problem 2.** (30 pts) Find the general solution of the differential equation and then find the solution of the initial value problem. Solve for  $y(t)$  explicitly.

$$\frac{dy}{dt} = te^{-t^2} - 2ty, \quad y(0) = 1$$

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**Problem 3.** (30 pts) Find the general solution of the differential equation. An implicit solution is fine.

$$2(y^2 - e^{-x} \sin 2y) \frac{dy}{dx} = e^{-x} \cos 2y$$

**Problem 4:** (10 pts) Fill in this chart of substitution methods for 1st order differential equations.

type	general form	substitution	resultant ODE type