

MthU343

Northeastern University

DiffEQs & Linear Alg. for Engineering

20 Minutes

Professor Gilmore

July 12, 2007

Quiz #2

Name: \_\_\_\_\_.

Show All Your Work

1. Solve the ordinary differential equation:  $x^2y' + 3xy = 2y^5$

2. Solve the initial value problem:  $4y'' - 12y' + 9y = 0$  with  $y(0) = 1$  and  $y'(0) = 2$ .

**Please Turn Over and Continue Working**

3. A 1959 Edsel is still running. Its engine provides an acceleration of  $10 \text{ ft/sec}^2$  while air resistance for this large clunker is  $0.2 \text{ ft/sec}^2$  for each  $\text{ft/sec}$  of the Edsel's speed.

a. Find the maximal possible (limiting) velocity of the car.

b. Find the time it takes to reach 90% of this limiting velocity.

c. ( Extra Credit 2 points ) How far does it travel in order to get to this 90% speed?