

MthU343

Northeastern University

DiffEQs & Linear Alg. for Engineering

30 Minutes

Professor Gilmore

July 17, 2008

Quiz #3

Name: _____.

Show All Your Work

1. Solve the following differential equation:

$$y'' + 25y = 3\cos(x) \text{ with } y(0) = 0 = y'(0).$$

2. Solve the following differential equation: $y'' + 2y' + y = 5e^{-x}$

Please Turn Over and Continue Working

3. a. If $f(t)$ is a piecewise continuous function, with $f(t)/e^{ct}$ bounded as t gets large, give the definition of the Laplace transform of $f(t)$, $\mathcal{L}\{f(t)\}$:

b. Use this basic definition to calculate the Laplace transform of t , $\mathcal{L}\{t\}$:

c. Find the Laplace transform of the function $f(x) = \begin{cases} 2 & \text{for } 3 \leq x \leq 4 \\ 0 & \text{for all other } x \end{cases}$