

Test Total

Name _____

Exam 3 Ordinary Differential Equations
25 Nov 2013 For full credit, show your work and use correct notation

Dr. Kreider

1. Solve the initial value problem $y' - 6y = 4$, $y(0) = 5$ using Laplace Transforms.

15 pts

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2. Solve the initial value problem $y'' + 4y' + 40y = 0$, $y(0) = 1$, $y'(0) = 2$ using Laplace Transforms.

15 pts

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3. Solve the initial value problem $y'' + 4y = \sin(2t)$, $y(0) = 4$, $y'(0) = -3$ using Laplace Transforms.

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4. Solve the initial value problem $y' - 2y = 2 + 3U(t - 6)$, $y(0) = 5$ using Laplace Transforms.

20 pts

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5. Solve the initial value problem $y'' - 3y' - 4y = 5\delta(t - 8)$, $y(0) = 10$, $y'(0) = 0$ using Laplace Transforms.

20 pts

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6. Solve the initial value problem using Laplace Transforms:

$$\begin{aligned}x'(t) &= 4x(t) + 5y(t) & x(0) &= 1 \\y'(t) &= -x(t) + 6y(t) & y(0) &= 5\end{aligned}$$

For reference, the inverse of $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is $\frac{1}{ad-bc} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$.

15 pts

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