

Name \_\_\_\_\_ ID \_\_\_\_\_

MATH 308  
Section 200

Exam III

Fall 2000  
P. Yasskin

1	/40
2	/10
3	/20
4	/30

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HAND COMPUTATIONS

1. (40 points) Use the Laplace Transform Technique to find the Laplace transform of the solution to the initial value problem

$$\frac{d^2y}{dt^2} + 3\frac{dy}{dt} + 2y = 9 + 6t \quad \text{with } y(0) = 1 \quad \text{and } y'(0) = 1.$$

2. (10 points)

a. Find the Laplace transform of the function:  $f(t) = te^{2t} \sin 3t$

b. Find the inverse Laplace transform of the function:  $G(s) = \frac{2e^{-2s}}{(s+1)^3}$

3. (20 points) Find the solution of the system

$$\begin{aligned}\frac{dx}{dt} &= -8x + 8y & x(0) &= 6 \\ \frac{dy}{dt} &= -3x + 2y & y(0) &= 4\end{aligned}$$

using the Eigenvector Technique.

## MAPLE COMPUTATIONS

4. (30 points) Find the solution of the system

$$\frac{dx}{dt} = -8x + 8y \quad x(0) = 6$$

$$\frac{dy}{dt} = -3x + 2y \quad y(0) = 4$$

using the Laplace Transform Technique. (You may not use the **dsolve** command except to check your answer.)

### To Turn in Your Maple Computations:

1. Save your Maple file as `lastname_exam3.mws`
2. Print your file as follows:
  - a. Click on **FILE**, **PRINT** and **Printer Command**.
  - b. Make the command read: **lpr -J "Yasskin Maple Exam 3"**
  - c. Call Dr. Yasskin over to check your printing.
  - d. Click on **PRINT**.
3. Mail your file as follows:
  - a. Start the mail program: **pine**
  - b. Compose a letter by typing **C**.
  - c. In the header region, enter:  
To **yasskin**  
Attachment **lastname\_exam3.mws** (or the *exact* name of your Maple file)  
Subject **Last Name Exam3**
  - d. Call Dr. Yasskin over to check your email.
  - e. Mail the letter by typing **^X** and **Y**.