

Math 252 – Quiz #4

June 10, 2011

Instructor: Patricia Wrean

Name: _____

Total: 25 points

1. Evaluate the following. (4 points)

a) $\mathcal{L}\{t^3 e^{7t}\}$

b) $\mathcal{L}^{-1}\left\{\frac{e^{-2s}}{s-3}\right\}$

2. Evaluate.

(5 points)

a) $\mathcal{L}\{t(1-e^{3t})^2\}$

b) $\mathcal{L}\{te^{2t} \cos 4t\}$

3. Evaluate.

(4 points)

$$\mathcal{L}^{-1} \left\{ \frac{s}{(s+3)(s^2+9)} \right\}$$

4. Use Laplace transforms to solve the following IVP. (5 points)

$$y'' + 4y = \cos 2t + 4 \sin 2t$$

$$\text{for } y(0) = 1 \text{ and } y'(0) = 6$$

5. Consider the following IVP, where $y(0) = 0$. (7 points)

$$y' + 3y = f(t), \text{ where } f(t) = \begin{cases} 12, & 0 \leq t < 2 \\ 0, & 2 \leq t < 4 \\ 12, & t \geq 4 \end{cases}$$

- a) Solve this DE.
- b) Calculate the value of $y(t)$ for $t = 3$.