

MATH4564 - Review for Test No1 - Fall 03 - Konaté

Notice: Show your work. A right answer with a bad reasoning will be considered as wrong. .

PROBLEM 1 • Find the Laplace Transform of the function:)

$$f_1(t) = t^4 \cos(t) \quad f_2(t) = (4t + 1)U_\pi(t) \quad f_3(t) = (1 + t)^2$$

PROBLEM 2 • Find the Laplace Transform of the function:

$$g_1(t) = \begin{cases} 0 & \text{for } 0 < t < 4 \\ t & \text{for } 4 < t < 6 \\ 2 & \text{for } 6 < t < +\infty \end{cases} \quad g_2(t) = \begin{cases} 1 & \text{for } 0 < t < \pi \\ t & \text{for } \pi < t < +\infty \end{cases}$$

PROBLEM 3 • Find the Inverse Laplace Transform of the function:

$$F_1(s) = -\frac{3s}{s^2 - 4s + 8} \quad F_2(s) = e^{-\pi s} \frac{3s^2 + 1}{2s^3 + 8s}$$

PROBLEM 4 • Find the Inverse Laplace Transform of the function:

$$F_1(s) = -\frac{s}{(s + 2)^2} \quad F_2(s) = \frac{4s}{s^2 - 2s - 3}$$

PROBLEM 5 • Use the Laplace Transform method to solve the differential equation:

Equation 1 $\begin{cases} 2y' + 3y = 1 \\ y(0) = 1 \end{cases}$

Equation 2 $\begin{cases} y'' + y' - 2y = 0 \\ y(0) = 1 \\ y'(0) = 1 \end{cases}$
