

MATH4564 - Review For Final Exam - Part 2- Fall 03 - Konaté

Notice: Show your work. A right answer with a bad reasoning will be considered as wrong. No Calculator allowed. The Table of Laplace Transforms and the usual abstracts are allowed.

1• Determine the Inverse Laplace Transform of:

1.a• $F(s) = \frac{-1}{(s+3)^2}$ **1.b•** $G(s) = \frac{s+3}{s^2-s-2}$

1.c• $H(s) = \frac{4}{(s-1)^3}$ **1.d•** $Y(s) = \frac{s}{s(s^2+4)}$

2• Find the Laplace Transform of: $f(t) = e^t u_2(t)$ $g(t) = e^{2t} \delta_{(t-1)}$

$$f(t) = \begin{cases} 0 & \text{for } 0 < t < 2 \\ t-2 & \text{for } t \geq 2 \end{cases}$$

$$f(t) = (t-3)u_\pi(t)$$

where $u_c(t)$ is the step function at the point $t = c$ and $\delta_{(t-c)}$ is the Generalized Dirac function at the point $t = c$

3• Consider:

$$f(x) = \begin{cases} x & \text{for } 0 < x < 1 \\ 2-x & \text{for } 1 < x < 2 \end{cases} \quad \text{and} \quad f_0(x) = \begin{cases} 0 & \text{for } 0 < x < 1 \\ f(x) & \text{for } 1 < x < 2 \end{cases}.$$

3.a• Find the even extension $f_+(x)$, the odd extension $f_-(x)$ of $f(x)$.

3.a• Find the Fourier series $S_+(x)$, $S_-(x)$ and $S_0(x)$ of $f_+(x)$, $f_-(x)$ and $f_0(x)$.
