Honours Degree of Bachelor of Science in Artificial Intelligence

Batch 21 - Level 2 (Semester 2)

CM 2320 - Mathematical Methods

Tutorial 6

1. Find the following:

a) $e^{-2t} * e^{-t}$

b) $t^2 * e^{-3t}$

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2. Find $f * g$ when

a) $f = 1, g = t$

b) $f = t^2, g = t$

c) $f = e^t, g = t$

d) $f = \sin(t), g = t$

In each case verify that $\mathcal{L}\{f\}\mathcal{L}\{g\} = \mathcal{L}\{f * g\}$.

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3. If $F(s) = \dfrac{1}{s-1}$, $G(s) = \dfrac{1}{s}$ and $H(s) = \dfrac{1}{2s+3}$, use the convolution theorem to find the inverse Laplace transforms of following:

a) $F(s)G(s)$

b) $F(s)H(s)$

c) $G(s)H(s)$

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4. Use the convolution theorem to determine the inverse Laplace transforms of following:

a) $\dfrac{1}{s^2(s+1)}$

b) $\dfrac{1}{(s+3)(s-2)}$

c) $\dfrac{1}{(s^2+1)^2}$

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