MthSc 208 (Fall 2011) Worksheet 5b

MthSc 208: Differential Equations (Fall 2011) In-class Worksheet 5b: Properties of Laplace Transforms

NAME:

Consider the following properties of the Laplace transform:

(i)
$$\mathcal{L}\lbrace e^{ct} f(t)\rbrace(s) = F(s-c)$$

(ii)
$$\mathcal{L}\{t^n f(t)\}(s) = (-1)^n F^{(n)}(s)$$

We also know that $\mathcal{L}\lbrace e^{at}\rbrace(s)=\frac{1}{s-a}, \text{ and } \mathcal{L}\lbrace t^n\rbrace(s)=\frac{n!}{s^{n+1}}, \text{ and } \mathcal{L}\lbrace \cos bt\rbrace(s)=\frac{s}{s^2+b^2}.$

1. Compute the Laplace transform of t^2e^{3t} using Property (i).

2. Compute the Laplace transform of t^2e^{3t} using Property (ii).

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3. Compute the Laplace transform of $e^{2t}\cos 3t$.

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