

**MthSc 208: Differential Equations (Spring 2011)**  
**In-class Worksheet 5e: Laplace Transforms and the Heavyside Function**

<b>NAME:</b>
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Recall the following properties of the Laplace transform:

(i)  $\mathcal{L}\{e^{at}\}(s) = \frac{1}{s - a}$

(ii)  $\mathcal{L}\{t^n\}(s) = \frac{n!}{s^{n+1}}$

(iii)  $\mathcal{L}\{f(t - c)H(t - c)\}(s) = e^{-cs}F(s)$

1. Compute  $\mathcal{L}\{(t - 3)^2 H(t - 3)\}(s)$ .

2. Compute  $\mathcal{L}\{t^2 H(t - 3)\}(s)$ .

3. Compute  $\mathcal{L}\{e^{t-1} H(t-1)\}(s)$ .

4. Compute  $\mathcal{L}\{e^{7-t} H(t-6)\}(s)$ .