Daily laplace - 4/5

$$f(t)=\begin{cases} 2t, & \text{if } 0\le t<3 \\ 4, & \text{if } t\ge 3 \end{cases} \qquad \mathcal{L}\{f(t)\}=?$$

$$f(t)=2t(1-u_3(t))+4u_3(t)$$
$$=2t-(2t-4)u_3(t)$$
$$=2t-(2t-6+2)u_3(t)$$
$$=2t-[2(t-3)+2]u_3(t)$$

$$\Rightarrow \mathcal{L}\{f(t)\}=2\cdot\frac{1}{s^2}-e^{-3s}\mathcal{L}\{2t+2\}$$
$$=\frac{2}{s^2}-e^{-3s}\left(\frac{2}{s^2}+\frac{2}{s}\right) \qquad (s>0)$$