

1. Compute the following.

(a)  $\mathcal{L}\{2t + e^{3t} \cosh 5t\}$

(b)  $\mathcal{L}\{f(t)\}$  where  $f(t) = \begin{cases} 2 & \text{if } t < 6 \\ te^t & \text{if } t \geq 6 \end{cases}$

(c)  $\mathcal{L}^{-1}\left\{\frac{5}{s} - \frac{s}{s^2+9}\right\}$

(d)  $\mathcal{L}^{-1}\left\{\frac{2s-3}{s^2+2s+10}\right\}$

2. [6.2.14] Solve  $y'' - 4y' + 4y = 0$  with  $y(0) = 1$  and  $y'(0) = 1$ .

3. [6.2.21] Solve  $y'' - 2y' + 2y = \cos t$  with  $y(0) = 1$  and  $y'(0) = 0$ .