

## TWK2A

### First translation theorem (Section 7.3.1)

### Problems

1. Determine

$$\mathcal{L}\{t^3 e^{-2t}\}.$$

2. Determine

$$\mathcal{L}\{e^{-2t} \cos 4t\}.$$

3. Determine

$$\mathcal{L}^{-1}\left\{\frac{s}{s^2 + 4s + 5}\right\}.$$

4. Determine

$$\mathcal{L}^{-1}\left\{\frac{(s+1)^2}{(s+4)^4}\right\}.$$

5. Determine

$$\mathcal{L}\{t^{10} e^{-7t}\}.$$

6. Determine

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

7. Determine

$$\mathcal{L}\{e^{2t} (t-1)^2\}.$$

8. Determine

$$\mathcal{L}\left\{e^{2t} \left(9 - 4t + 10 \sin \frac{t}{2}\right)\right\}.$$

9. Determine

$$\mathcal{L}^{-1}\left\{\frac{1}{(s-1)^4}\right\}.$$

10. Determine

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