

13.6 Use the time-shifting theorem to determine $\mathcal{L}[f(t)]$, where $f(t) = [e^{-(t-2)} - e^{-2(t-2)}]u(t-2)$.

SOLUTION:

$$\text{Let } g(t) = (e^{-t} - e^{-2t})u(t) \quad G(s) = \frac{1}{s+1} - \frac{1}{s+2}$$

$$F(s) = e^{-2s}G(s) = e^{-2s} \left(\frac{s+2 - (s+1)}{(s+2)(s+1)} \right)$$

$$F(s) = \frac{e^{-2s}}{(s+1)(s+2)}$$