

3.08ad*

fredag 26 januari 2024

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a)

$$f(t) = t \sin(t-1) \theta(t-1)$$

$$g(t) = \sin(t) \theta(t) \mapsto \frac{1}{s^2 + 1}$$

$$h(t) = g(t-1) \mapsto \frac{e^{-s}}{s^2 + 1} = H(s)$$

$$+ h(t) \mapsto -\frac{d}{ds} H(s) =$$

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

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

d)

$$f(t) = t \theta(t-1)$$

$$g(t) = \theta(t) \mapsto \frac{1}{s}$$

$$h(t) = g(t-1) \mapsto \frac{e^{-s}}{s} = H(s)$$

$$+ h(t) \mapsto -\frac{d}{ds} H(s) =$$

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