7.10

torsdag 22 februari 2024 19:46

a)

$$h = S\,\delta = \cos + \theta(t)$$

$$H(s) = \frac{s}{s^2+1}$$

$$s\theta = \int_0^t \cos\tau\, d\tau \quad \theta(t) = \sin + \theta(t)$$

b)

$$F(s) = \frac{1}{s+1}$$

$$Y(s) = \frac{1}{s^2}$$

$$H(s) = \frac{Y(s)}{F(s)} = \frac{s+1}{s^2}$$

$$h(t) = \theta(t) + t\,\theta(t) = (t+1)\,\theta(t)$$

$$S\,\theta = \int_0^t (\tau+1)\, d\tau\, \theta(t) = \frac{t(t+2)}{2}\theta(t)$$

c)

$$Y(s) = e^{-s}/s^2$$

$$F(s) = 1/s^2$$

$$H(s) = \frac{Y(s)}{F(s)} = e^{-s}$$

$$h(t) = \delta(t-1)$$

$$S\,\theta(t) = \int_{-\infty}^{t} \delta(\tau-1)\, d\tau = \theta(t-1)$$

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