3.10ad*

fredag 26 januari 2024 21:44

$$\mathcal{L}_1 f = \frac{3s^4}{s^5+1}, \quad f(0) = 3$$

a)

$$v(t) = e^t \underbrace{f(t)\theta(t)}_{g(t)}$$

$$g(t) = f(t)\cdot\theta(t) \longmapsto \mathcal{L}(\theta f) = \frac{3s^4}{s^5+1}$$

$$e^t g(t) \longmapsto \frac{3(s-1)^4}{(s-1)^5+1}$$

d)

$$f(3t)\theta(t) \iff f(3t)\theta(3t)$$

$$g(t) = f(t)\theta(t) \longmapsto \mathcal{L}(f\theta) = \frac{3s^4}{s^5+1}$$

$$g(3t) \longmapsto \frac{(s/3)^4}{(s/3)^5+1} = \frac{3s^4}{s^5+3^5}$$