Answer on Question #48240, Engineering, Other

Question:

Is the laplace transform of a double integral is [F(s)]/[s^2]

Answer:

If $G(s) = \mathcal{L}\{g(t)\}$, then

$$\mathcal{L}\left\{\int_0^t g(t)dt\right\} = \frac{G(s)}{s}$$

Now if we have $G'(s) = \mathcal{L}\{g'(t)\}$ and:

$$\mathcal{L}\left\{\int_0^t g'(t)dt\right\} = \frac{G'(s)}{s}$$

$$g(t) = \int_0^t g'(t)dt \quad \text{and} \quad G(s) = \frac{G'(s)}{s}$$

$$\mathcal{L}\left\{\int_0^t g(t)dt\right\} = \mathcal{L}\left\{\int_0^t \int_0^t g'(t)dtdt\right\} = \frac{G(s)}{s} = \frac{G'(s)}{s^2}$$

Answer: yes, it is.