Answer on Question #57227-Physics-Other

Q. Using Laplace table find Laplace transform of f(t)=3t2+2e-t-5cost

Solution

Laplace transform is linear, so

$$\mathcal{L}\{f(t)\} = \mathcal{L}\{3\mathrm{t}^2 + 2\mathrm{e}^{-\mathrm{t}} - 5\mathrm{cost}\} = 3\mathcal{L}\{\mathrm{t}^2\} + 2\mathcal{L}\{\mathrm{e}^{-\mathrm{t}}\} - 5\mathcal{L}\{\mathrm{cost}\}.$$

Thus,

$$\mathcal{L}\{f(t)\} = 3 \cdot \frac{2!}{s^{2+1}} + 2 \cdot \frac{1}{s+1} - 5 \cdot \frac{s}{s^2+1} = \frac{6}{s^3} + \frac{2}{s+1} - \frac{5s}{s^2+1}.$$

Answer: $\frac{6}{s^3} + \frac{2}{s+1} - \frac{5s}{s^2+1}$.