H 26

(1)

L[eat f(e)](s) =
$$\int_{0}^{\infty} e^{b-s/t} \int_{t}^{t} u \, dt$$

L[f(u)](s-a) = $\int_{0}^{\infty} \int_{t}^{t} u \, dt$

L[eat f(e)](s) = $L[f(u)](s-a)$

(2)

L[cesot]₀; $\int_{0}^{\infty} e^{st} \cos at \, dt$

= $\left[-\frac{1}{5}e^{st} \cos at\right]_{0}^{\infty} - \int_{0}^{\infty} e^{st} \sin at \, dt$

= $\frac{1}{5} + \left[\frac{a}{5}e^{st} \sin at\right]_{0}^{\infty} - \int_{0}^{\infty} \frac{a^{3}}{5^{3}}e^{st} \cos at \, dt$

L[cos at]_(s) = $\frac{5}{5^{3}}$

L[cos at]_(s) = $\frac{5}{5^{3}}$, $\frac{5}{5^{3}}$, $\frac{5}{5^{3}}$, $\frac{5}{5^{3}}$ escapt dt

= $0 + \left[-\frac{2}{5^{3}}e^{st} \cos at\right]_{0}^{\infty} - \int_{0}^{\infty} \frac{a^{3}}{5^{3}}e^{st} \sin at \, dt$

L[sinat]₀ = $\frac{a}{5^{3}}$

L[sinat] = $\frac{a}{5^{3}}$

L[sinat] = $\frac{a}{5^{3}}$

$$L[e^{at}f(t)](s) = L[f(t)](s-a)$$

$$\mathcal{L}\left[\cos \alpha t\right]_{(S)} = \int_{0}^{\infty} e^{-St} \cos \alpha t \, dt$$

$$= \left[-\frac{1}{S}e^{-St} \cos \alpha t\right]_{0}^{\infty} - \int_{0}^{\infty} \frac{a}{s}e^{-St} \sin \alpha t \, dt$$

$$= \frac{1}{S} + \left[\frac{\alpha}{S^{2}}e^{-St} \sin \alpha t\right]_{0}^{\infty} - \int_{0}^{\infty} \frac{a^{2}}{S^{2}}e^{-St} \cos \alpha t \, dt$$

$$\left[1 + \frac{a^{2}}{S^{2}}\right]_{\infty} = \left[\cos \alpha t\right]_{(S)} = \frac{S}{S^{2} + 0^{2}}$$

$$\mathcal{L}\left[\cos \alpha t\right]_{(S)} = \frac{S}{S^{2} + 0^{2}}$$

$$\mathbb{E}[\sin \alpha t]_{(S)^{2}} \int_{0}^{\infty} e^{-st} \sin \alpha t \, dt$$

$$= \left[-\frac{1}{5} e^{-st} \sin \alpha t \right]_{0}^{\infty} + \int_{0}^{\infty} \frac{\alpha}{5} e^{-st} \cos \alpha t \, dt$$

$$= 0 + \left[-\frac{\alpha}{5^{2}} e^{-st} \cos \alpha t \right]_{0}^{\infty} - \int_{0}^{\infty} \frac{\alpha^{2}}{5^{2}} e^{-st} \sin \alpha t \, dt$$

$$\left[1 + \frac{\alpha^{2}}{5^{2}} \right] \mathbb{E}\left[\sin \alpha t \right] = \frac{\alpha}{5^{2}}$$