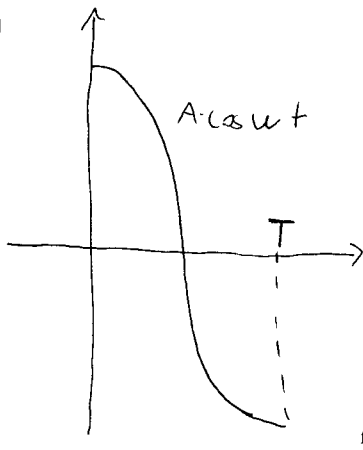


(1)

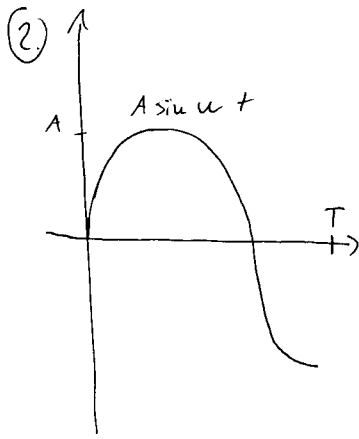


$$\omega = \frac{2\pi}{2T} = \frac{\pi}{T}$$

$$\begin{aligned} \mathcal{L} \{ [\mathcal{E}(t) - \mathcal{E}(t-T)] \cdot A \cdot \cos \omega t \} &= \\ &= \mathcal{L} \{ \mathcal{E}(t) \cdot A \cdot \cos \omega t \} - \mathcal{L} \{ \mathcal{E}(t-T) \cdot A \cdot \cos \omega t \} = \end{aligned}$$

$$\begin{aligned} \cos \omega t &= \cos \omega ((t-T) + T) = \cos \omega (t-T) \cdot \cos \omega T + \sin \omega (t-T) \cdot \sin \omega T = \\ &= \cos \omega (t-T) \cdot \underbrace{\cos \frac{\pi}{T} T}_{\cos \pi = -1} + \sin \omega (t-T) \cdot \underbrace{\sin \frac{\pi}{T} T}_0 = -1 \cos \omega (t-T) \end{aligned}$$

$$\begin{aligned} &= \mathcal{L} \{ \mathcal{E}(t) \cdot A \cdot \cos \omega t \} + \mathcal{L} \{ \mathcal{E}(t-T) \cdot A \cdot \cos \omega (t-T) \} = \frac{A s}{s^2 + \omega^2} + \frac{A s}{s^2 + \omega^2} \cdot e^{-sT} = \\ &= \underline{\underline{\frac{A s (1 + e^{-sT})}{s^2 + \omega^2}}} \end{aligned}$$



$$\mathcal{L}\{[E(t) - E(t-T)] \cdot A \cdot \sin \omega t\} = \mathcal{L}\{E(t) \cdot A \cdot \sin \omega t\} - \mathcal{L}\{E(t-T) \cdot A \cdot \sin \omega t\} =$$

$$\sin \omega t = \sin(\omega(t-T) + \omega T) = \sin \omega(t-T) \cos \omega T + \cos \omega(t-T) \cdot \sin \omega T =$$

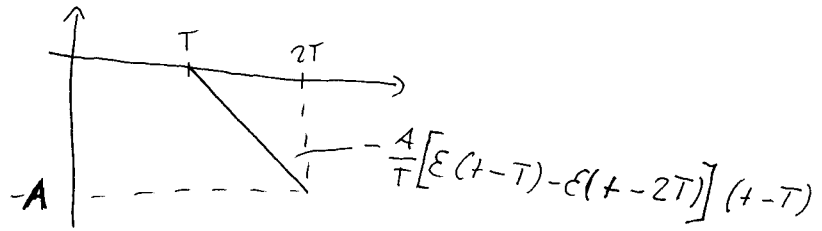
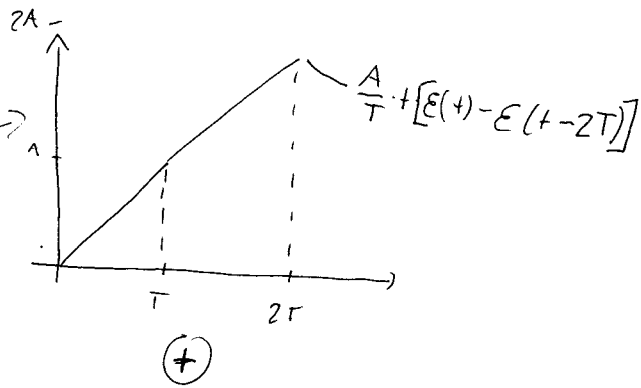
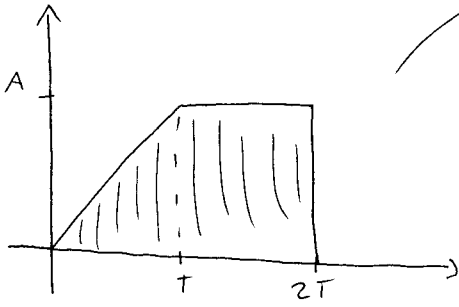
$$= \sin \omega(t-T) \cdot \underbrace{\cos \frac{3}{2} \frac{\pi}{T} \cdot T}_{\cos \frac{3}{2} \pi = 0} + \cos \omega(t-T) \cdot \underbrace{\sin \frac{3}{2} \frac{\pi}{T} \cdot T}_{\sin \frac{3}{2} \pi = -1} = -\cos \omega(t-T)$$

$$\omega = \frac{2\pi}{\frac{4}{3}T} = \frac{6}{4} \frac{\pi}{T} = \frac{3}{2} \frac{\pi}{T}$$

$$= \mathcal{L}\{E(t) \cdot A \cdot \sin \omega t\} + \mathcal{L}\{E(t-T) \cdot A \cdot \cos \omega(t-T)\} =$$

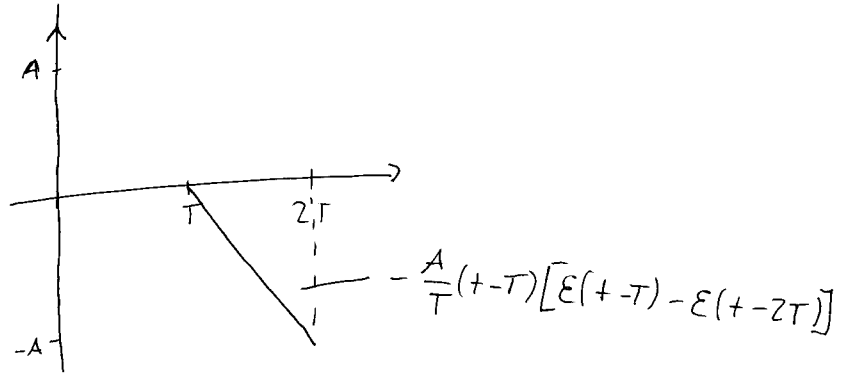
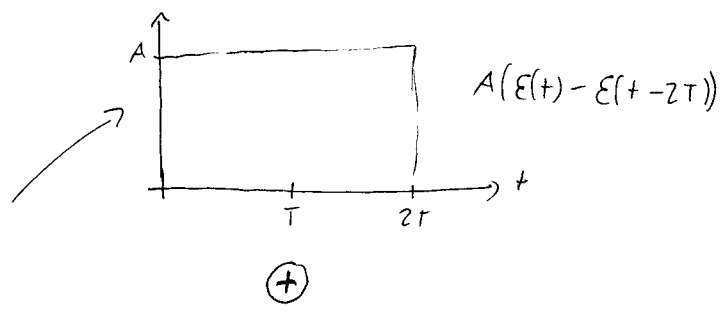
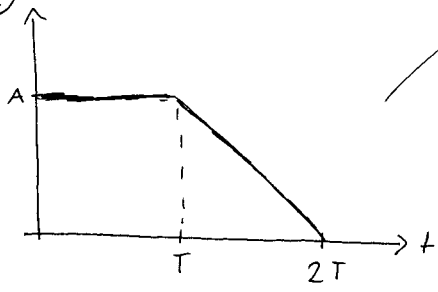
$$= \frac{A\omega}{s^2 + \omega^2} + \frac{A \cdot s}{s^2 + \omega^2} \cdot e^{-sT} = \underline{\underline{\frac{A(\omega + s e^{-sT})}{s^2 + \omega^2}}}$$

(3)



$$\begin{aligned}
 & \mathcal{L} \left\{ \frac{A}{T} + [E(t) - E(t-2T)] - \frac{A}{T}(t-T)[E(t-T) - E(t-2T)] \right\} = \\
 & = \mathcal{L} \left\{ \frac{A}{T}t \cdot E(t) - \frac{A}{T}tE(t-2T) - \frac{A}{T}(t-T)E(t-T) + \frac{A}{T} + E(t-2T) + \frac{A}{T}TE(t-2T) \right\} = \\
 & = \frac{A}{T} \cdot \frac{1}{s^2} - \frac{A}{T} \cdot \frac{1}{s^2} \cdot e^{-sT} + \mathcal{L} \{ A E(t-2T) \} = \frac{A}{T} \cdot \frac{1}{s^2} - \frac{A}{T} \cdot \frac{1}{s^2} \cdot e^{-sT} + \frac{1}{s} \cdot e^{-2sT} = \\
 & = \underline{\underline{\frac{1}{s} \left( \frac{A}{Ts} - \frac{Ae^{-sT}}{Ts} + e^{-2sT} \right)}}
 \end{aligned}$$

4.



$$\begin{aligned}
 & \mathcal{L} \left\{ A[E(t) - E(t-2T)] - \frac{A}{T}(t-T)[E(t-T) - E(t-2T)] \right\} = \\
 & = \mathcal{L} \{ A \cdot E(t) \} - \mathcal{L} \{ A \cdot E(t-2T) \} - \mathcal{L} \left\{ \frac{A}{T}(t-T)E(t-T) \right\} + \mathcal{L} \left\{ \frac{A}{T}(t-T)E(t-2T) \right\} = \\
 & = \frac{A}{s} - \frac{A}{T} \frac{1}{s^2} \cdot e^{-sT} - \mathcal{L} \{ A \cdot E(t-2T) \} + \mathcal{L} \left\{ \frac{A}{T}(t-2T+T)E(t-2T) \right\} = \\
 & \quad \mathcal{L} \left\{ \frac{A}{T}(t-2T)E(t-2T) \right\} + \mathcal{L} \left\{ \frac{A}{T} E(t-2T) \right\} \\
 & = \frac{A}{s} - \frac{A}{T} \frac{1}{s^2} \cdot e^{-sT} + \frac{A}{T} \frac{1}{s^2} e^{-2sT} = \frac{A}{s} \left( 1 - \frac{e^{-sT}}{Ts} + \frac{e^{-2sT}}{Ts} \right)
 \end{aligned}$$