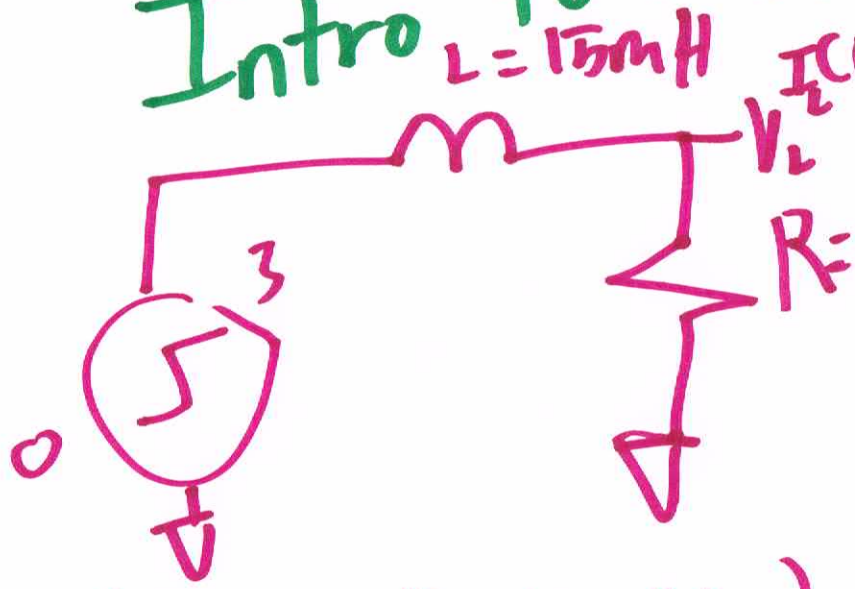
EE221 Circuits II

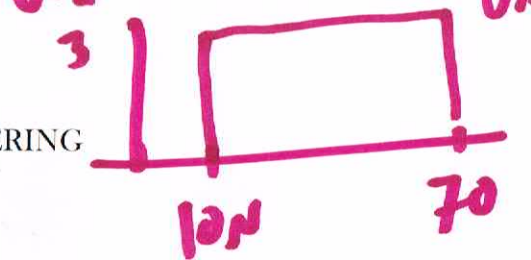
April 17th, 2021

Intro to MATLAB



$$V_L(s) = V_{in}\frac{R}{R+sL} = V_{in}\frac{R/L}{s+R/L}$$

Pulse(0, 3, 10n, 1p, 1p, 60n)



$$V_{in}(t) = 3u(t-10n) - 3u(t-70n)$$

$$= \left[\frac{3e^{-s10n}}{s} - \frac{3e^{-s70n}}{s}\right]$$

$$V_L(s) = \frac{R/L}{s + R/L}\left[\frac{3e^{-s10n}}{s} - \frac{3e^{-s70n}}{s}\right]$$

$$= \left[\frac{A}{s} + \frac{B}{s+R/L}\right]e^{-s10n} - \left[\frac{C}{s} + \frac{D}{s+R/L}\right]e^{-s70n}$$

$$\frac{3R/L}{0+R/L} = 3 = A = C$$

$$B = \frac{3R/L}{-R/L} = -3 = D$$

$$= V_L(s) = \left[\frac{3}{s} - \frac{3}{s+R/L}\right]e^{-s10n} - \left[\frac{3}{s} - \frac{3}{s+R/L}\right]e^{-s70n}$$

$\tau = 1/R$, $1/\tau$

$$V_L(t) = \left(3 - 3e^{-\frac{(t-10n)}{\tau}}\right)u(t-10n) - \left(3 - 3e^{-\frac{(t-70n)}{\tau}}\right)u(t-70n)$$

$$V_{in}(t) = 3\,u(t-10\mu) - 3\,u(t-70\mu)$$

$$V_{in}(t) - V_L(t) = +3e^{-\frac{(t-10\mu)}{\tau}}\,u(t-10\mu) - 3e^{-\frac{(t-10\mu)}{\tau}}\,u(t-70\mu)$$