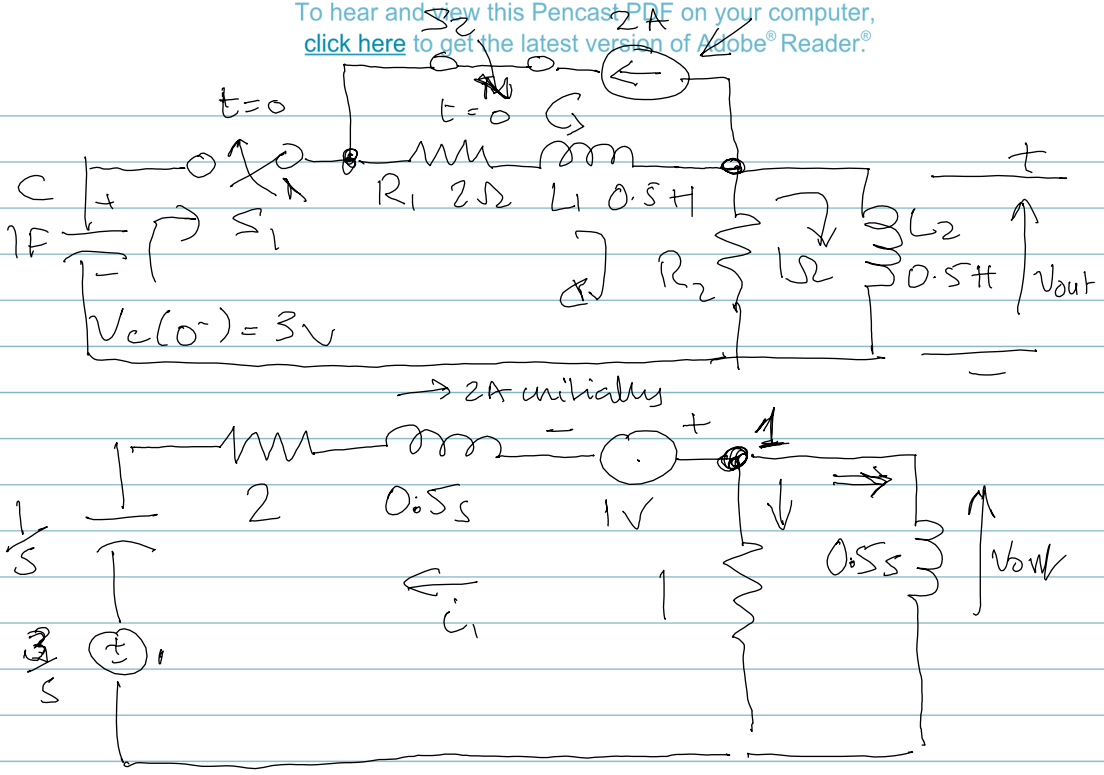

$V_c(0^-) = 3V$

$$i_{L_1}(0^-) = 2A$$

$$L_1 i_{L_1}(0^-) = \frac{1}{2} \times 2 = 1V$$

KCL @ Node 1

$$\frac{V_{out}(s) - 1 - 3/s}{1/s + 2 + s/2} + \frac{V_{out}}{1} + \frac{V_{out}}{s/2} = 0$$

$$\left(V_{out}\left[-1-3/s\right]\right)(s/2)$$

$$+ V_{out}(s/2)(1/s+2+s/2)$$

$$+ V_{out}(1/s+2+s/2) = 0$$

$$V_{out}\left(\frac{s}{2}+\frac{1}{2}+s+\frac{s^2}{4}+\frac{1}{s}+2+\frac{s}{2}\right)=0$$

$$\frac{4s}{4s}\cdot V_{out}\left(\frac{2s^2+2s+4s^2+s^3+4+8s+2s}{4s}\right)$$

$$= \frac{4s\left(1+\frac{3}{s}\right)}{4s+}$$

$$= 4s\left(\frac{s}{2}+\frac{3}{2}\right)$$

$$= 2s^2+6s$$

$$= 2s(s+3)$$

$$V_{out}\left(s^3+8s^2+10s+4\right) = 2s(s+3)$$

$$V_{out} = \frac{2s(s+3)}{s^3+8s^2+10s+4}$$

$$V_{out}(s) = \frac{2s(s+3)}{(s+6.57)(s^2+1.43s+0.61)}$$

$$= \frac{r_1}{s+6.57} + \frac{r_2 s + r_3}{(s^2+1.43s+0.61)}$$

$$r_1 = \left.\frac{2s(s+3)}{s^2+1.43s+0.61}\right|_{s=-6.57}$$

$$= 1.36$$

$$2s(s+3) = r_1(s^2+1.43s+0.61) + (r_2 s + r_3)(s+6.57)$$

$$0 = 0.61 r_1 + 6.57 r_3$$

$$r_1 = 1.36$$

$$r_3 = -0.12$$

$$6s = 1.43s\, r_1 + (6.57 + r_3)s$$

$$6 = 1.43 + 6.57 + r_3.$$

$$2 = r_1 + r_2$$

$$r_2 = 0.64$$

$$V_{out}(s) = \frac{1.36}{s+6.57} + \frac{0.64(s-0.13)}{(s^2+1.43s+0.611)}$$

$$\frac{s+a}{(s+a)^2+w^2} \qquad \frac{w}{(s+a)^2+w^2}$$

$$s^2+2as+a^2$$

$$2a = 1.43$$

$$a = 0.715$$

$$a^2 = 0.511$$

$$w^2 = 0.61 - 0.511$$

$$w = 0.315$$

$$\frac{(s+0.715)}{(s+0.715)^2+0.315^2} + \frac{0.315}{(s+0.715)^2+0.315^2}$$

$$0.64(s-0.1875) \qquad 0.715-0.1875$$

$$+0.715s \qquad 0.715$$

$$-0.1875 + x = 0.715$$

$0.715 + 0.1875 = x$

$x = 0.9025$

$0.64(s + 0.715) + 0.64(0.9025)$

$0.5776 = x * 0.315$

$x = 1.84$

$V_{out} = \frac{1.36}{s+6.57}$

$+ \frac{0.64(s+0.715)}{(s+0.715)^2 + (0.315)^2}$

$+ \frac{1.84(0.315)}{(s+0.715)^2 + (0.315)^2}$

$V_{out}(t) = 1.36e^{-6.57} + 0.64e^{-0.715t}\cos 0.715t + 1.84e^{-0.715t}\sin 0.315t$