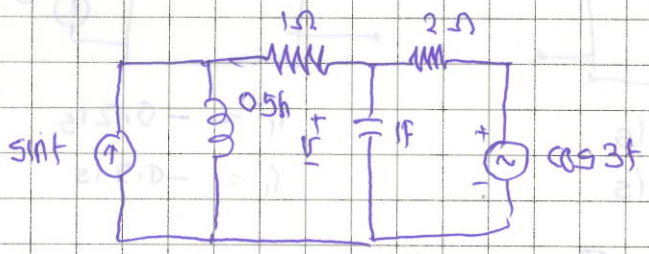
EE101 ELECTRICAL ENGINEERING ASSIGNMENT / /

Q1 Using superposition theorem find $v(t)$ in steady state



Q2: Solve the same problem in Q1 by state-space methods. Assume network is in zero state with no initial values.

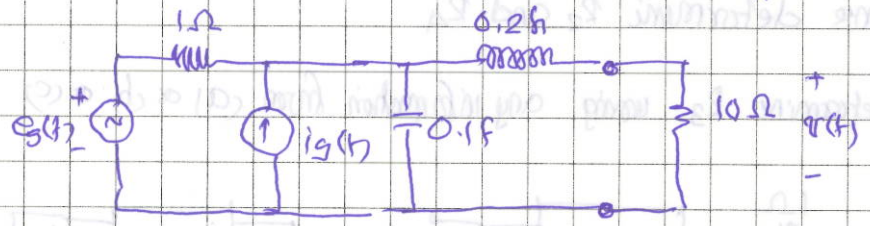
Q3 The network is in sinusoidal steady state

$$e_s(t) = 9\cos 10t \qquad i_s(t) = 2\cos(10t - \pi/3)$$

(a) Find Thevenin equivalent of network to the left of AB

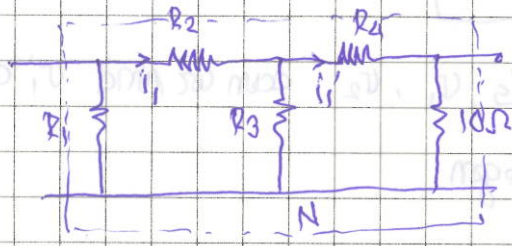
(b) Find Norton equivalent "

(c) calculate $v(t)$ with the use of Thevenin equivalent.



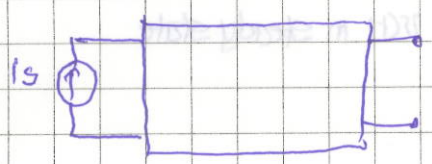
$e_s(t)$ and $i_s(t)$ are as given above

Q4



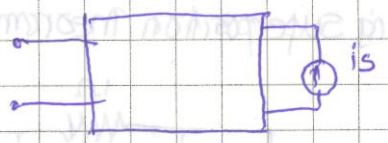
solo

(a) Two measurements are made for i_1 and i_1' as shown in figs below:



$i_1 = 0.6\, i_s$

$i_1' = 0.3\, i_s$

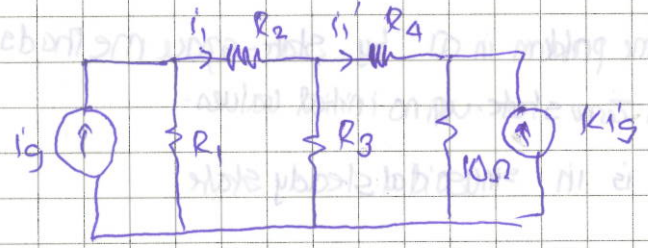


$i_1 = -0.2\, i_s$

$i_1' = -0.9\, i_s$

Find R_1 using Tellegens theorem.

(b)



What is the value of K to make current in R_3 zero.

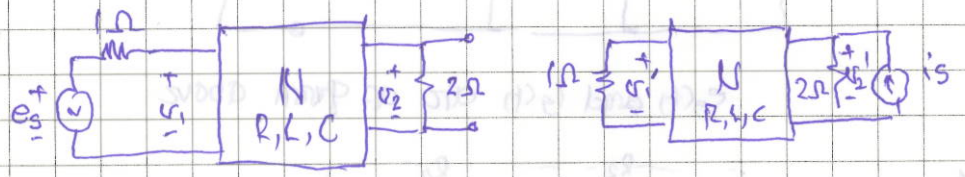
Use R_1 from (a)

(c) With the value of K in (b), find i_1 and i_1' $(= i_1)$

Hence determine R_2 and R_4

(d) determine R_3 using any information from (a) or (b) or (c)

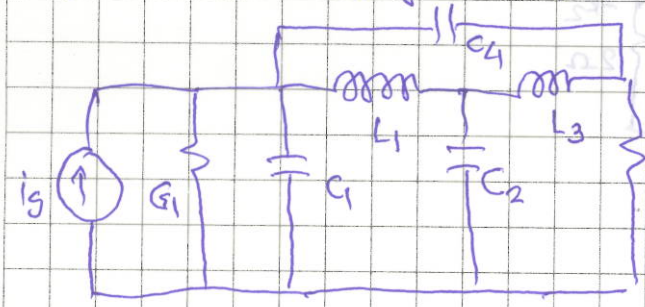
Q5:

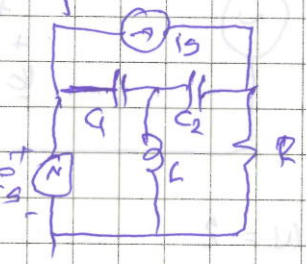


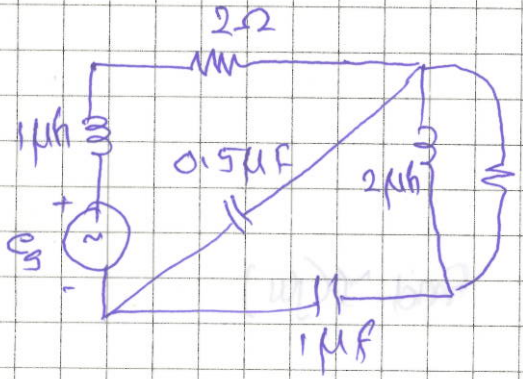
given e_s, i_s, v_1, v_2 can we find v_1' and v_2'

using Tellegen.

Q6: Write state equations for the following networks:

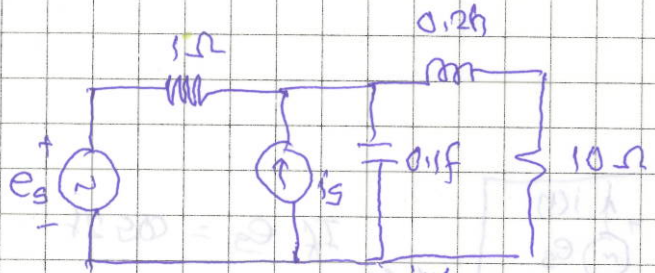






(Don't try to solve for the state)

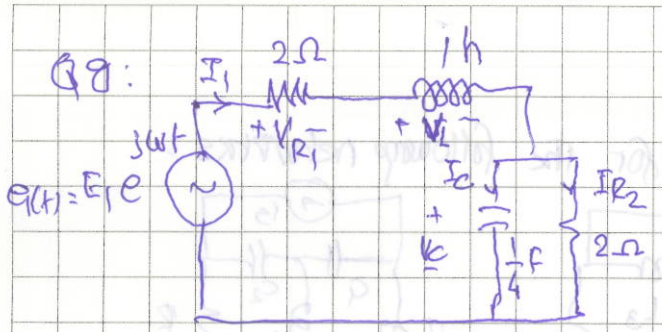
Q7:



$e_s = E_s e^{j\omega t}$ $\quad i_s = I_s e^{j\omega t}$

Draw the phasor diagram for the network.

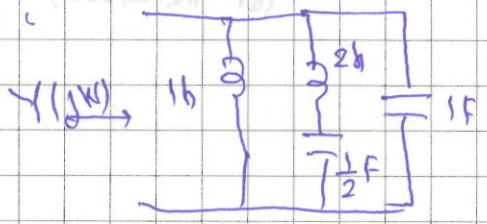
Q8:



$\omega = 2$

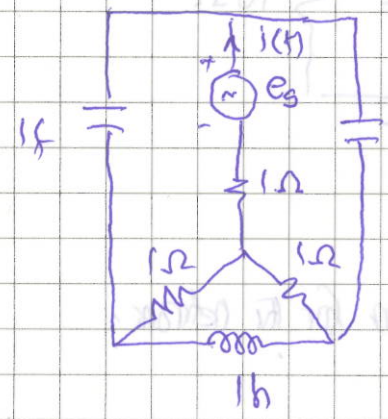
Draw the phasor diagram

Q9:



find $Y(j\omega)$

Q10:



If $e_s = \cos 2t$

find $i(t)$ in sinusoidal steady state