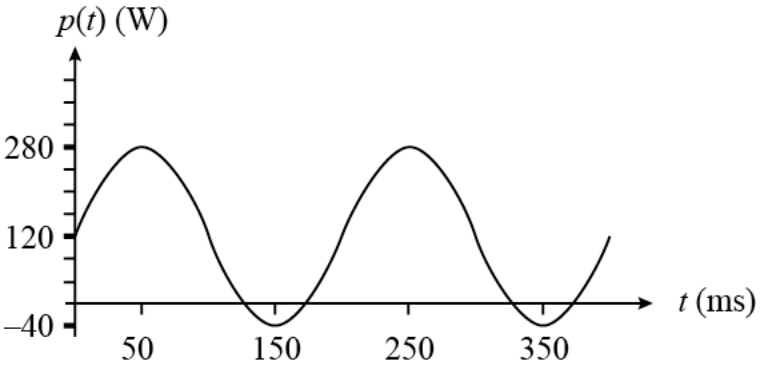
1.



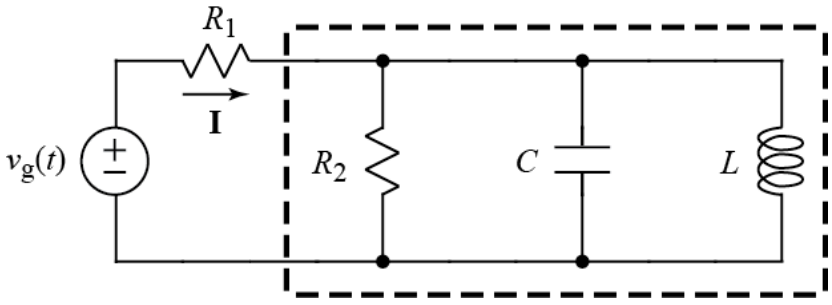
Use the waveform of power versus time shown above to answer the following questions:

a) Determine the value of ω.

b) Calculate complex power $S = P + jQ$.

c) Can the phasor values of **V** and **I** be determined uniquely from the waveform? If so, find **V** and **I**.

2.



$v_g(t) = 5\cos(2\mathrm{M}t)\,\mathrm{V}$

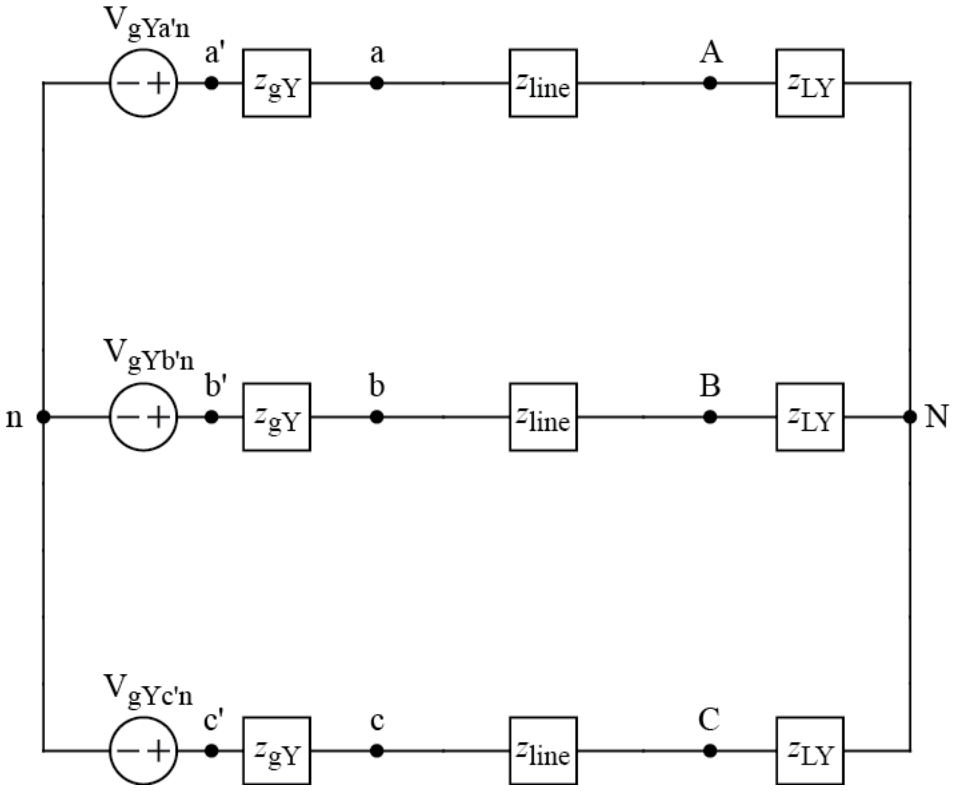
$R_1 = 0.1\ \Omega$ $R_2 = 1\ \Omega$

$C = 1\mu\mathrm{F}$ $L = 125\ \mathrm{nH}$

a) Calculate **I**.

b) Calculate the complex power, S, for the components inside the box.

3.



$V_{gYa'n} = 120\angle 0°$ V $\quad z_{gY} = j0.3\ \Omega$

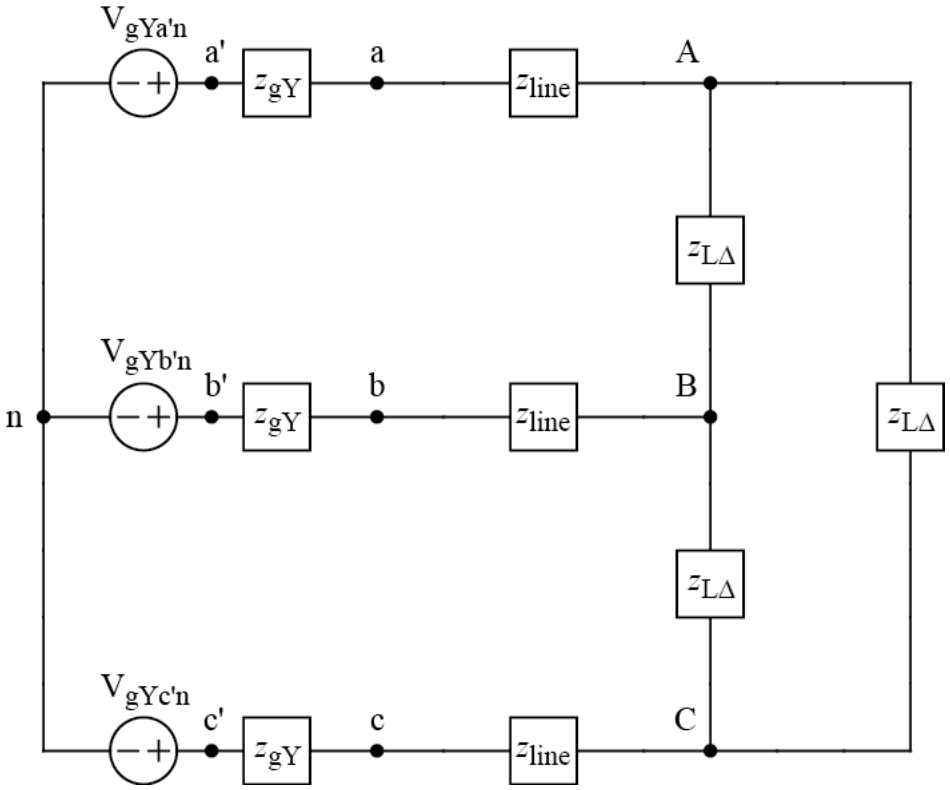
$V_{gYb'n} = 120\angle +120°$ V $\quad z_{line} = j0.6\ \Omega$

$V_{gYc'n} = 120\angle -120°$ V $\quad z_{LY} = 3 - j0.1\ \Omega$

a) Draw the single-phase equivalent circuit.

b) Calculate $\mathbf{V}_{aA}$.

4.



$V_{gYa'b'} = 2930\angle 0°$ V $\quad z_{gY} = j4\Omega$

$V_{gYb'c'} = 2930\angle +120°$ V $\quad z_{line} = j2\ \Omega$

$V_{gYc'a'} = 2930\angle -120°$ V $\quad z_{L\Delta} = 24\ \Omega$

a) Draw the single-phase equivalent circuit.

b) Calculate $\mathbf{V}_{BC}$.

5. a) Calculate $\mathbf{I}_{AB}$.

b) Write a numerical time-domain expression for $v_{BC}(t)$.