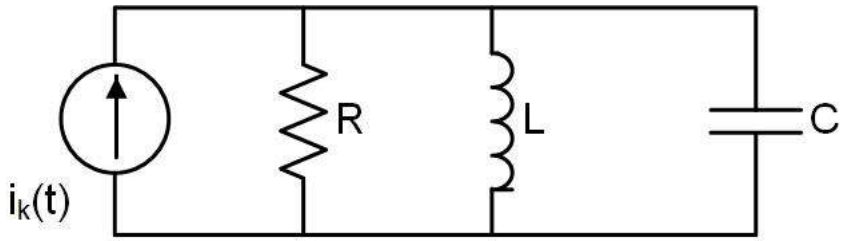
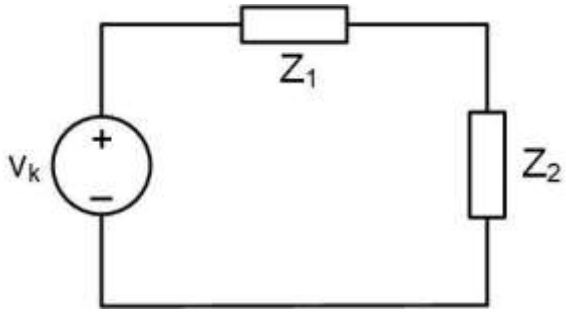
2023-2024 Spring semester, CSA, CRN:22167, Exercise 2

The circuits for questions 1 – 4 are in sinusoidal steady state.

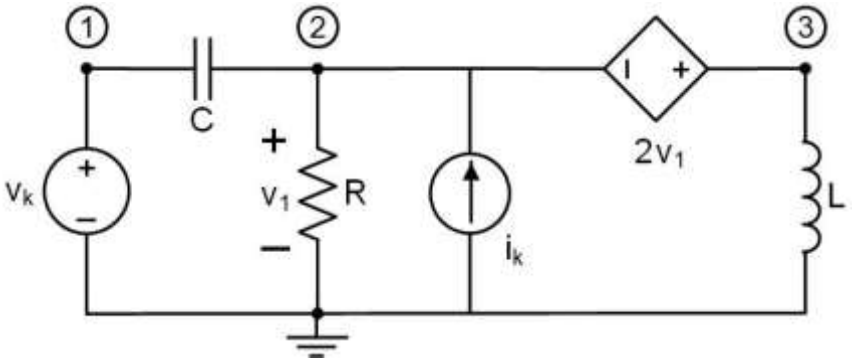
1) Find the resonance frequency for the parallel resonance circuit.



2) Find the complex power of Z_1, Z_2 and the voltage source. What are power factors of Z_1 and Z_2?
$v_k(t) = 10\cos(20t)$, $Z_1 = (1 + j2)\ \Omega$, $Z_2 = (1 - j3)\ \Omega$



3-a) Make generalized nodal analysis and write the equations in matrix form. (use phasors)
3-b) Find the current, voltage and average power of the dependent source.
$C = 1F$, $L = 1H$, $R = 1\Omega$, $v_k = \cos(t)$, $i_k(t) = 2\cos(t)$



4) Make generalized mesh analysis and write the equations in matrix form. (use phasors)
$v_k(t) = 34\cos(2t + 60°)$