EE 101 Tutorial Problems 6
(18 September 2014)

1. Find the voltage $v_0$ in the circuit shown in Fig. 1. (Note that the two sources have two different frequencies).

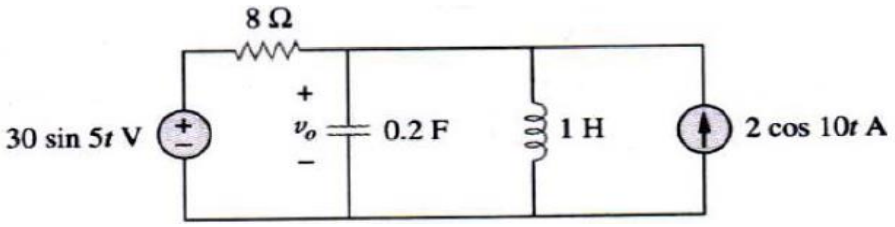


Figure 1

2. Find the expression for the current through the inductance in the circuit shown in Figure 2, using operational impedances (with operator $p$) when the switch S is closed. Hence find the expression for the current through the inductance as a function of time. Find
   a. The initial value of the current through the inductance
   b. The steady state value of the current through the inductance
   c. The time constant of the circuit
   d. Time taken by the current through the inductance to reach a value of 1 A.

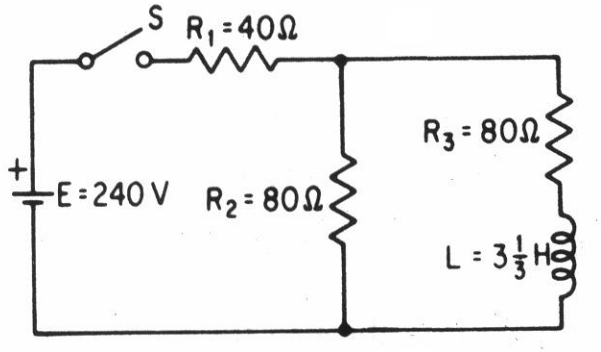


Figure 2

3. Draw the per-phase equivalent circuit for the three phase circuit shown in Figure 3. If $R$ = 6 Ω and $X = j24$ Ω, find
   a. The current supplied by the source and the power factor
   b. The total real and reactive powers drawn by the load
   c. The voltage across R in Figure 3
   d. The voltage across X in Figure 3

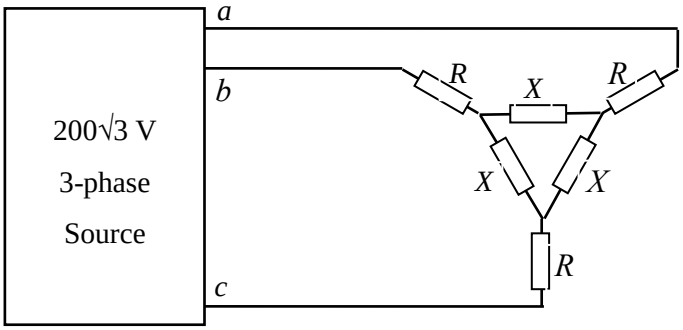


Figure 3