NeSS
Tutorial-8

Sinusoidal excitation

Q1. Let vs = 40 cos 8000t V in the circuit of Fig. 10.7. Use Thévenin's theorem where it will do the most good, and find the value at t = 0 for (a) iL ; (b) vL ; (c) iR ; (d) is .

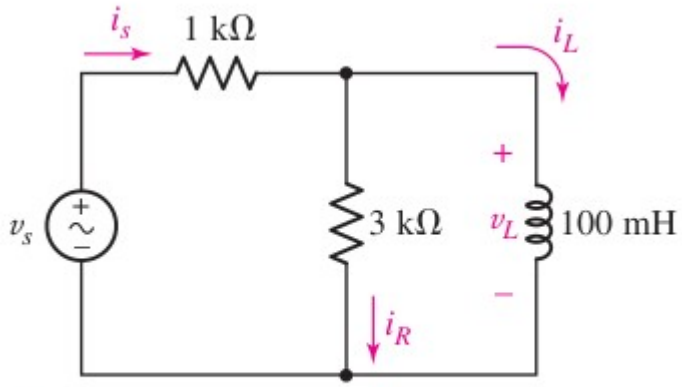
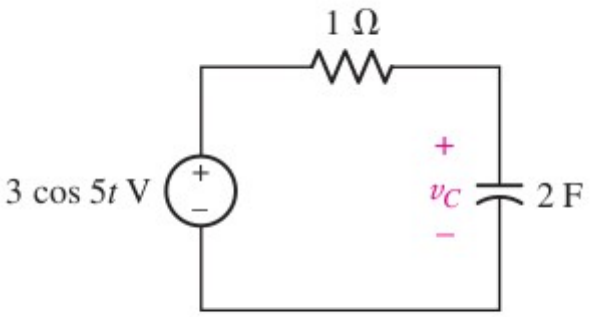


FIGURE 10.7

Q2. Find Vc(t) in below figure



(a)

Phasor representation:

Q3. Let ω = 2000 rad/s and t = 1 ms. Find the instantaneous value of each of the currents given here in phasor form: (a) j10 A; (b) 20 + j10 A; (c) 20 + j(10/20◦) A.

Reactance of R,L and C

Q4. Apply the voltage 8/−50° V at a frequency ω = 100 rad/s to a 4 H inductor, and determine the phasor current and the time-domain current.

Q5. In the circuit of Fig. 10.17, both sources operate at ω = 1 rad/s. If IC = 2/28 ◦ A and I L = 3/53 ◦ A, calculate (a) I s ; (b) V s ; (c) iR1 (t).

a

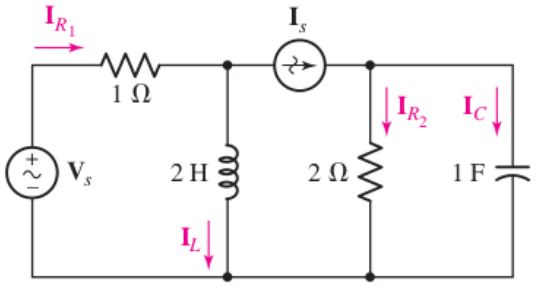
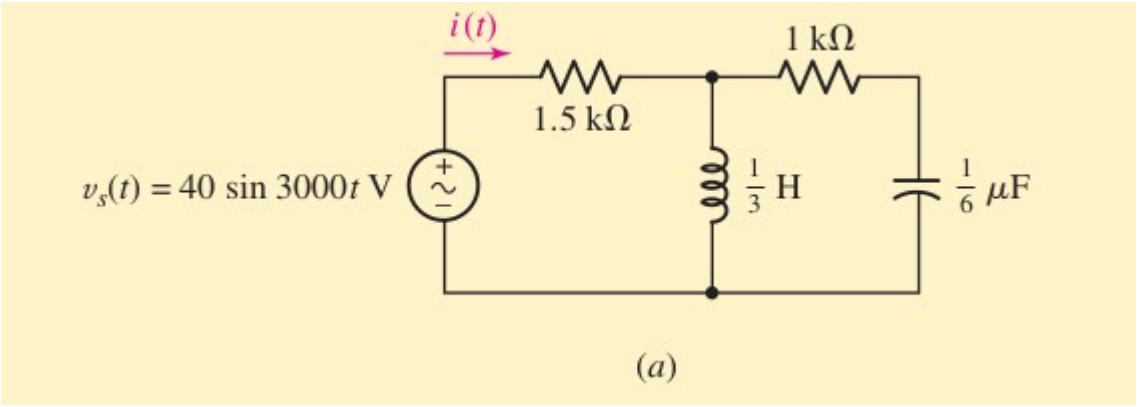


FIGURE 10.17 A three-mesh circuit. Each source operates at the same frequency ω.

Q6. Find the current i(t) in the circuit shown in Fig. 10.20a.



Q7. Use nodal analysis on the circuit of Fig. 10.23 to find V 1 and V 2 .

a

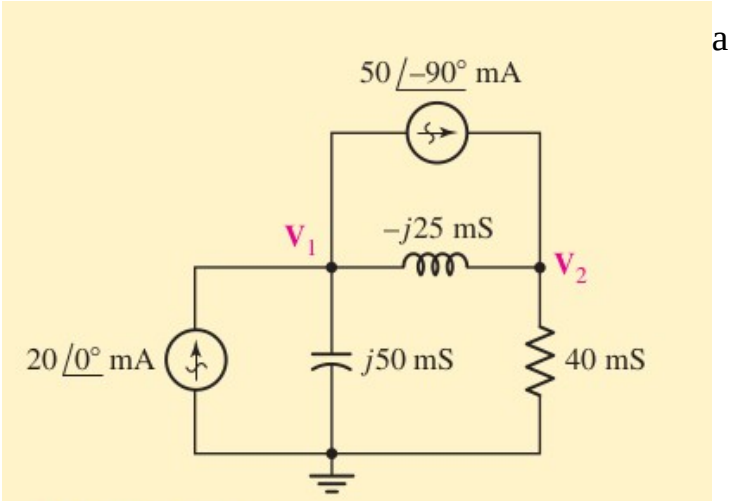


FIGURE 10.23

Superposition:

Q8. Determine the current i through the 4ohms resistor of Fig. 10.34.

a

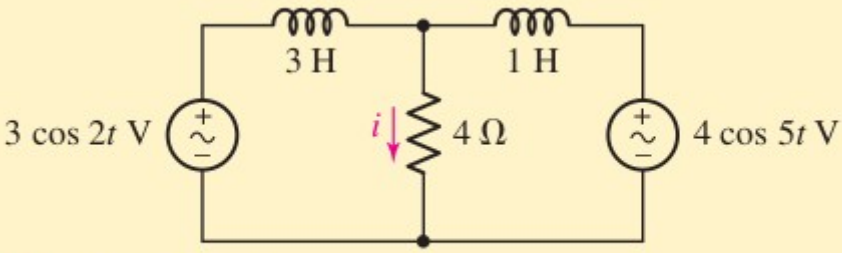


FIGURE 10.34

Thevenin, nortal equivalents:

Q9. For the circuit of Fig. 10.32, find the (a) open-circuit voltage V ab ; (b) downward current in a short circuit between a and b; (c) Thévenin equivalent impedance Z ab in parallel with the current source.

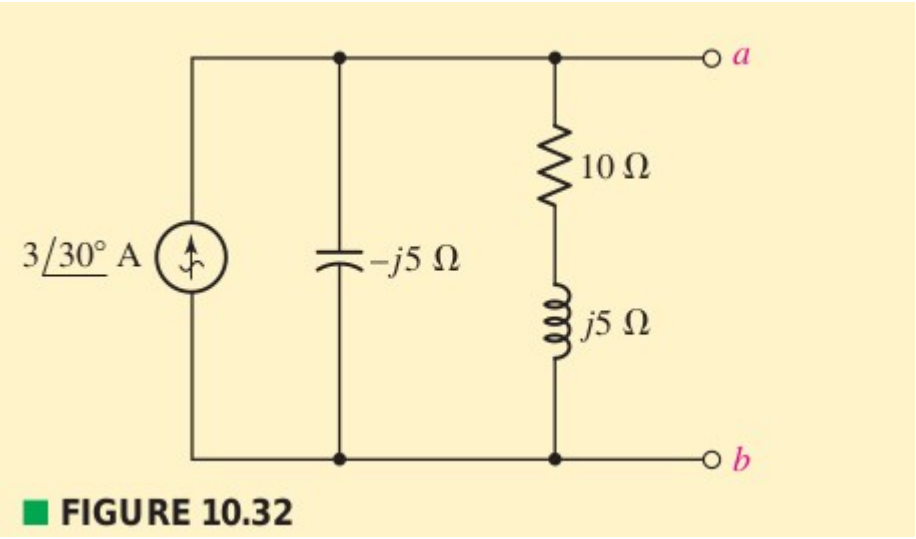


FIGURE 10.32