

HW10: **Name:** _____

Lab Section: _____

9.11 Use the concept of the phasor to combine the following sinusoidal functions into a single trigonometric expression:

a. $y = 50 \cos(500t + 60^\circ) + 100 \cos(500t - 30^\circ)$,

b. $y = 200 \cos(377t + 50^\circ) - 100 \sin(377t + 150^\circ)$,

c. $y = 80 \cos(100t + 30^\circ) - 100 \sin(100t - 135^\circ) + 50 \cos(100t - 90^\circ)$,

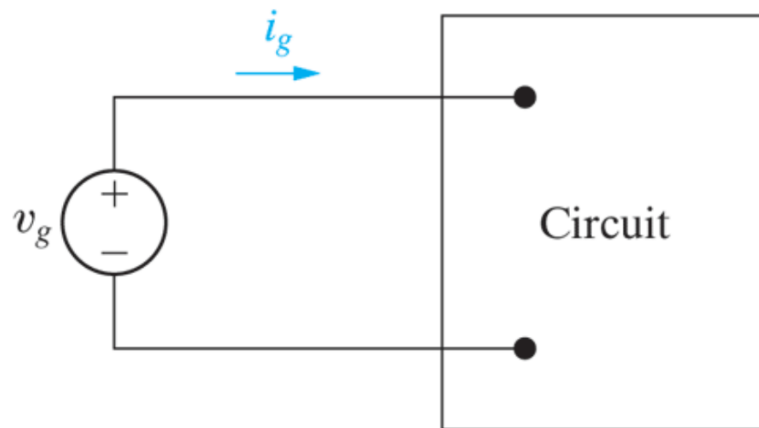
d. $y = 250 \cos \omega t + 250 \cos(\omega t + 120^\circ) + 250 \cos(\omega t - 120^\circ)$.

9.12 The expressions for the steady-state voltage and current at the terminals of the circuit seen in Fig.P9.12 are

$$\begin{aligned}v_g &= 300 \cos(5000\pi t + 78^\circ)\text{V}, \\i_g &= 6 \sin(5000\pi t + 123^\circ)\text{A}\end{aligned}$$

- What is the impedance seen by the source?
- By how many microseconds is the current out of phase with the voltage?

Figure P9.12

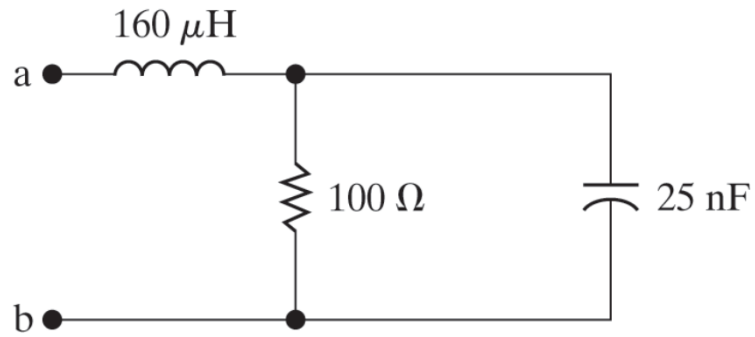


9.27

PSPICE
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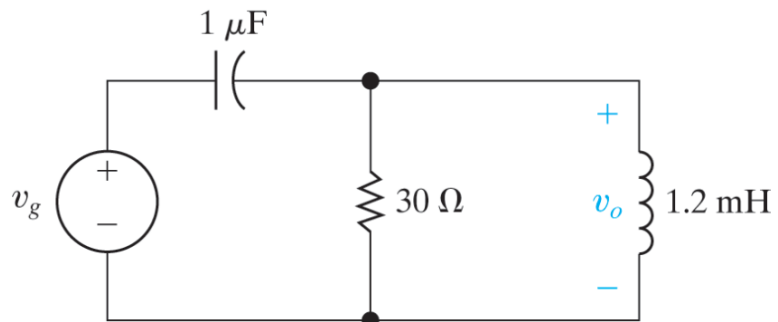
- a. For the circuit shown in Fig.P9.27, find the frequency (in radians per second) at which the impedance Z_{ab} is purely resistive.
- b. Find the value of Z_{ab} at the frequency of (a).

Figure P9.27



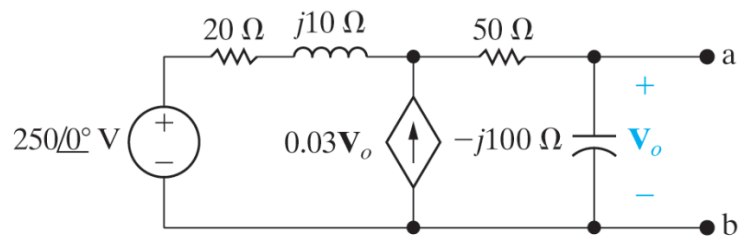
- 9.28 PSPICE
MULTISIM The circuit in Fig.P9.28 is operating in the sinusoidal steady state. Find the steady-state expression for $v_o(t)$ if $v_g = 40 \sin 50,000t$ V.

Figure P9.28



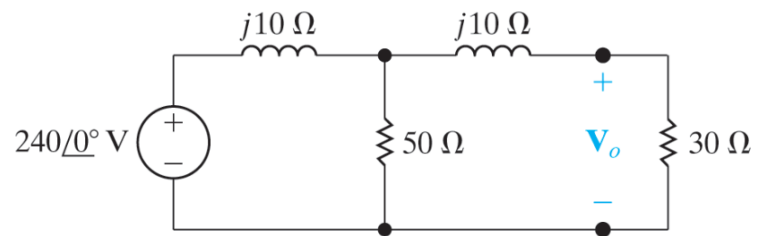
- 9.50 Find the Thévenin equivalent circuit with respect to the terminals a,b of the circuit shown in Fig.P9.50.

Figure P9.50



9.55 Use the node-voltage method to find \mathbf{V}_o in the circuit in Fig.P9.55.

Figure P9.55



9.69 PSPICE
MULTISIM The op amp in the circuit in Fig.P9.69 is ideal.

- Find the steady-state expression for $v_o(t)$.
- How large can the amplitude of v_g be before the amplifier saturates?

Figure P9.69

