

Chapter 9, Problem 6.

For the following pairs of sinusoids, determine which one leads and by how much.

- (a) $v(t) = 10 \cos(4t - 60^\circ)$ and $i(t) = 4 \sin(4t + 50^\circ)$
 (b) $v_1(t) = 4 \cos(377t + 10^\circ)$ and $v_2(t) = -20 \cos 377t$
 (c) $x(t) = 13 \cos 2t + 5 \sin 2t$ and $y(t) = 15 \cos(2t - 11.8^\circ)$

1.

Using phasors, find:

- (a) $3\cos(20t + 10^\circ) - 5 \cos(20t - 30^\circ)$
 (b) $40 \sin 50t + 30 \cos(50t - 45^\circ)$
 (c) $20 \sin 400t + 10 \cos(400t + 60^\circ) - 5 \sin(400t - 20^\circ)$

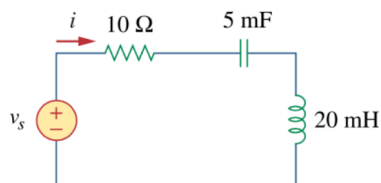
2.

Using phasors, determine $i(t)$ in the following equations:

- (a) $2 \frac{di}{dt} + 3i(t) = 4 \cos(2t - 45^\circ)$
 (b) $10 \int i \, dt + \frac{di}{dt} + 6i(t) = 5 \cos(5t + 22^\circ)$

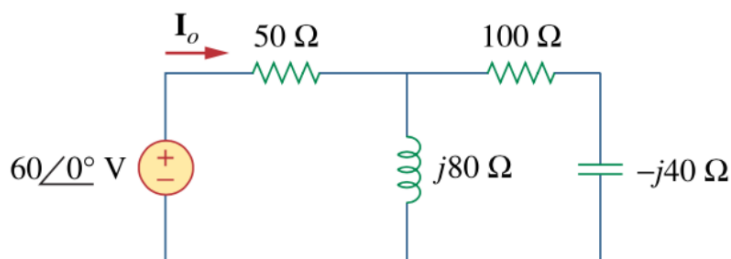
3.

Find current i in the circuit of Fig. 9.42, when $v_s(t) = 50 \cos 200t$ V.



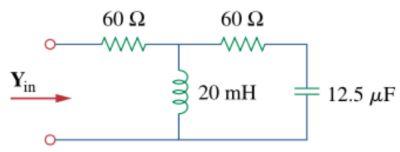
4.

Find current $\mathbf{I}_o$ in the circuit shown in Fig. 9.50.

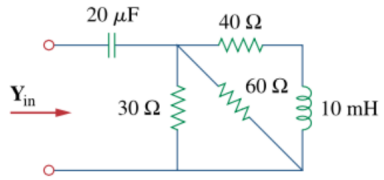


5.

At $\omega = 10^3$ rad/s find the input admittance of each of the circuits in Fig. 9.74.



(a)



(b)

6.

7.