

Chapter 9, Solution 47.

In the circuit shown in Fig. 9.54, determine the value of $i_s(t)$.

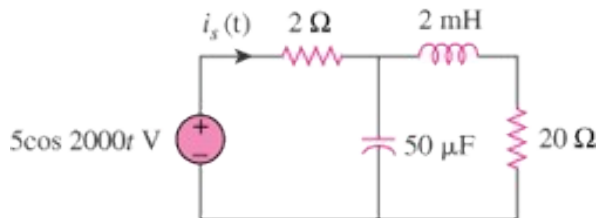
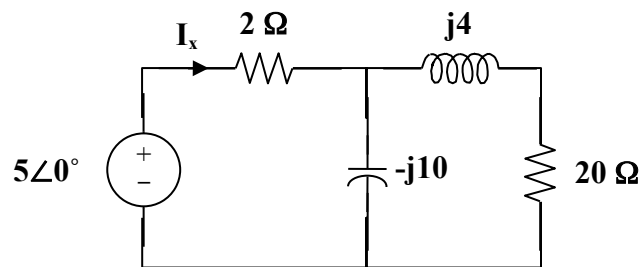


Figure 9.54
For Prob. 9.47.

Solution

First, we convert the circuit into the frequency domain.



$$I_x = \frac{5}{2 + \frac{-j10(20 + j4)}{-j10 + 20 + j4}} = \frac{5}{2 + 4.588 - j8.626} = \frac{5}{10.854 \angle -52.63^\circ} = 0.4607 \angle 52.63^\circ$$

$$i_s(t) = 460.7 \cos(2000t + 52.63^\circ) \text{ mA}$$