Chapter 9, Solution 37.

$$Y = \frac{1}{4} + \frac{1}{j8} + \frac{1}{-j10} = \underline{0.25 - j0.025 \ \text{S}} = \mathbf{\underline{250–j25\ mS}}$$

Chapter 9, Solution 41.

$$\omega = 1,$$

$$1\ \text{H} \longrightarrow \quad j\omega L = j(1)(1) = j$$

$$1\ \text{F} \longrightarrow \quad \frac{1}{j\omega C} = \frac{1}{j(1)(1)} = -j$$

$$\mathbf{Z} = 1 + (1 + j) \,||\, (-j) = 1 + \frac{-j + 1}{1} = 2 - j$$

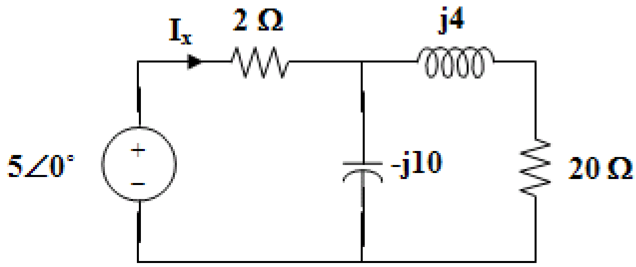
$$\mathbf{I} = \frac{\mathbf{V}_s}{\mathbf{Z}} = \frac{10}{2 - j}, \qquad \mathbf{I}_c = (1 + j)\,\mathbf{I}$$

$$\mathbf{V} = (-j)(1 + j)\,\mathbf{I} = (1 - j)\,\mathbf{I} = \frac{(1 - j)(10)}{2 - j} = 6.325\angle -18.43°$$

Thus, v(t) = **<u>6.325 cos(t – 18.43°) V</u>**

Chapter 9, Solution 47.

First, we convert the circuit into the frequency domain.



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

$i_s(t)$ = **<u>460.7cos(2000t +52.63°) mA</u>**

Chapter 9, Solution 56.

$$50\mu F \longrightarrow \frac{1}{j\omega C} = \frac{1}{j377x50x10^{-6}} = -j53.05$$

$$60mH \longrightarrow j\omega L = j377x60x10^{-3} = j22.62$$

$$Z_{in} = 12 - j53.05 + j22.62 // 40 = \underline{21.692 - j35.91\ \Omega}$$