

Chapter 9, Solution 24.

(a)

$$\mathbf{V} + \frac{\mathbf{V}}{j\omega} = 10\angle 0^\circ, \quad \omega = 1$$

$$\mathbf{V}(1 - j) = 10$$

$$\mathbf{V} = \frac{10}{1 - j} = 5 + j5 = 7.071\angle 45^\circ$$

Therefore,

$$v(t) = 7.071\cos(t + 45^\circ) \text{ V}$$

(b)

$$j\omega\mathbf{V} + 5\mathbf{V} + \frac{4\mathbf{V}}{j\omega} = 20\angle(10^\circ - 90^\circ), \quad \omega = 4$$

$$\mathbf{V}\left(j4 + 5 + \frac{4}{j4}\right) = 20\angle -80^\circ$$

$$\mathbf{V} = \frac{20\angle -80^\circ}{5 + j3} = 3.43\angle -110.96^\circ$$

Therefore,

$$v(t) = 3.43\cos(4t - 110.96^\circ) \text{ V}$$