Chapter 9, Solution 35.

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

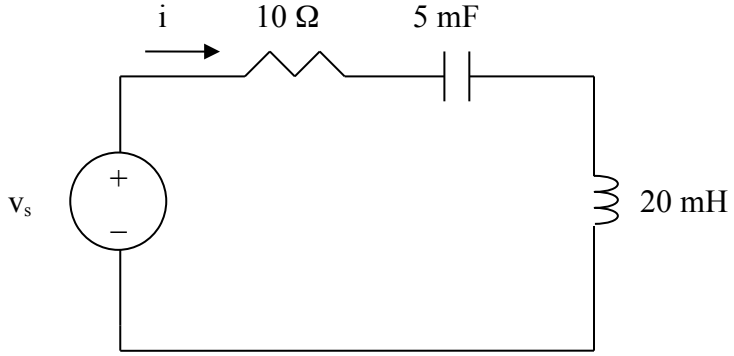

Figure 9.42
For Prob. 9.35.

Solution

$$v_s(t) = 50\cos 200t \longrightarrow V_s = 50 < 0^o, \omega = 200$$

$$5mF \longrightarrow \frac{1}{j\omega C} = \frac{1}{j200x5x10^{-3}} = -j$$

$$20mH \longrightarrow j\omega L = j20x10^{-3}x200 = j4$$

$$Z_{in} = 10 - j + j4 = 10 + j3$$

$$I = \frac{V_s}{Z_{in}} = \frac{50 < 0^o}{10 + j3} = 4.789 < -16.7^o$$

i(t) = **4.789cos(200t–16.7°) A**