Chapter 10, Solution 49.

Using source transformation, find *i* in the circuit of Fig. 10.94.

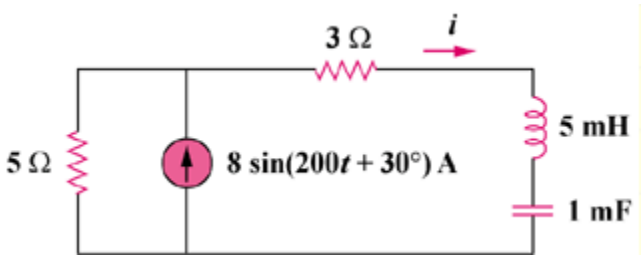


Figure 10.94
For Prob. 10.49.

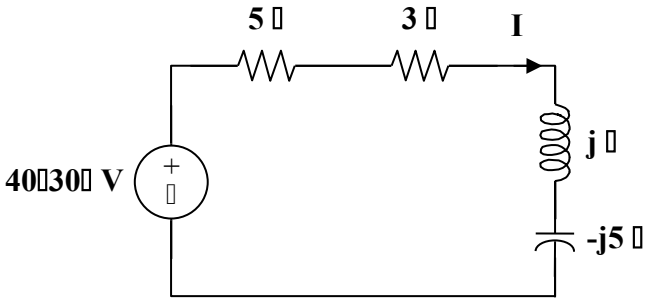
Solution

$$8\sin(200t + 30°) \longrightarrow 8\angle 30°, \quad \omega = 200$$

$$5\text{ mH} \longrightarrow j\omega L = j(200)(5\times 10^{-3}) = j$$

$$1\text{ mF} \longrightarrow \frac{1}{j\omega C} = \frac{1}{j(200)(1\times 10^{-3})} = -j5$$

After transforming the current source, the circuit becomes that shown in the figure below.



$$\mathbf{I} = \frac{40\angle 30°}{5 + 3 + j - j5} = \frac{40\angle 30°}{8 - j4} = 4.472\angle 56.56°$$

$$i = [4.472\sin(200t+56.56°)]\text{ A}$$

$$4.472\sin(200t + 56.56°)\text{ A}$$