

Chapter 11, Solution 97

A power transmission system is modeled as shown in Fig. 11.99. If $V_s = 240 \angle 0^\circ$ rms, find the average power absorbed by the load.

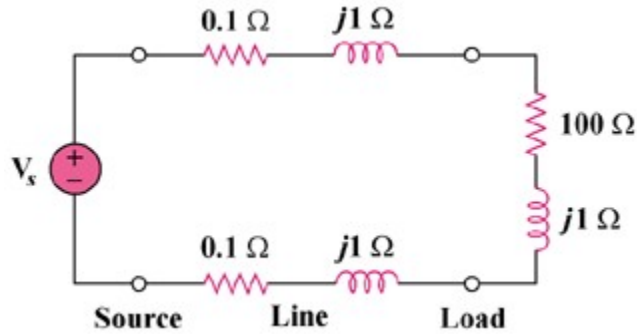


Figure 11.99
For Prob, 11.97.

Solution

$$Z_T = (2)(0.1 + j) + (100 + j20) = 100.2 + j22 \Omega$$

$$I = \frac{V_s}{Z_T} = \frac{240}{100.2 + j22}$$

$$P = |I|^2 R_L = 100 |I|^2 = \frac{(100)(240)^2}{(100.2)^2 + (22)^2} = \mathbf{547.3 \text{ W}}$$