Homework Problem #045
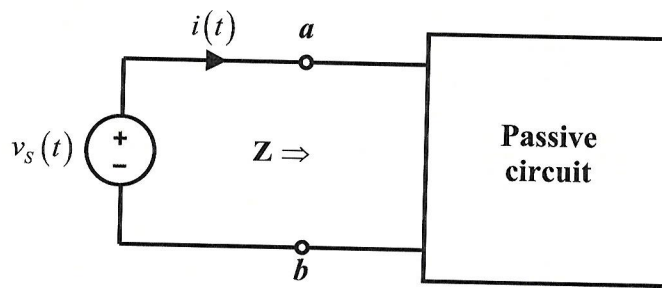
In response to an input signal voltage

$$v_S(t) = 24\cos 2000\pi t \text{ V},$$

the input current in the circuit shown was measured as

$$i(t) = 6\cos(2000\pi t - 60°) \text{ mA}.$$

Determine the equivalent input impedance $\mathbf{Z}$ of the circuit.

$$V_s = 24 \underline{/0°} \text{ V}$$

$$I = 6 \underline{/-60°} \text{ A}$$

$$Z = \frac{V_s}{I} = \frac{24 \underline{/0°}}{6 \underline{/-60°}} = 4 \underline{/60°} \ \Omega$$