Chapter 11, Solution 77.

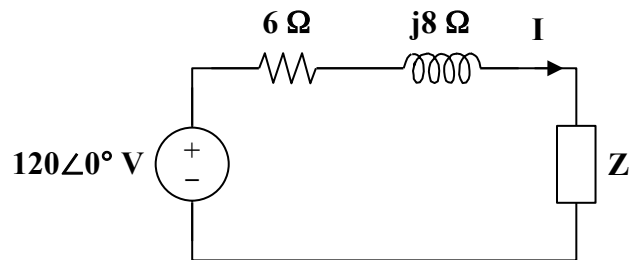The wattmeter measures the power absorbed by the parallel combination of 0.1 F and 150 Ω.

$$120\cos(2t) \longrightarrow 120\angle0°, \quad \omega = 2$$

$$4\,H \longrightarrow j\omega L = j8$$

$$0.1\,F \longrightarrow \frac{1}{j\omega C} = -j5$$

Consider the following circuit.

$$\mathbf{Z} = 15 \,\|\, (-j5) = \frac{(15)(-j5)}{15 - j5} = 1.5 - j4.5$$

$$\mathbf{I} = \frac{120}{(6 + j8) + (1.5 - j4.5)} = 14.5\angle\text{-}25.02°$$

$$\mathbf{S} = \frac{1}{2}\mathbf{V}\mathbf{I}^* = \frac{1}{2}\left|\mathbf{I}\right|^2\mathbf{Z} = \frac{1}{2}\cdot(14.5)^2(1.5 - j4.5)$$
$$\mathbf{S} = 157.69 - j473.06 \text{ VA}$$

The wattmeter reads
$$P = \text{Re}(\mathbf{S}) = \textbf{157.69 W}$$