

Instantaneous Power Example

$$f := 60 \quad \text{Hz} \quad \omega := 2 \cdot \pi \cdot f \quad \omega = 376.991 \quad \text{rad/s}$$

$$T := \frac{1}{f} \quad T = 0.0167 \quad \text{s} \quad n := 0..360 \quad t_n := \frac{n}{180} \cdot T$$

Assume standard wall voltage and a resistive-inductive load of $10/\underline{45}^\circ \Omega$.

$$v_n := 170 \cdot \cos(\omega \cdot t_n) \quad \text{V} \quad i_n := 17 \cdot \cos\left(\omega \cdot t_n - \frac{\pi}{4}\right) \quad \text{A} \quad p_n := v_n \cdot i_n$$

$$P_{ave_n} := \frac{170 \cdot 17}{2} \cdot \cos\left(\frac{\pi}{4}\right) \quad P_{ave_0} = 1021.769 \quad \text{W}$$

