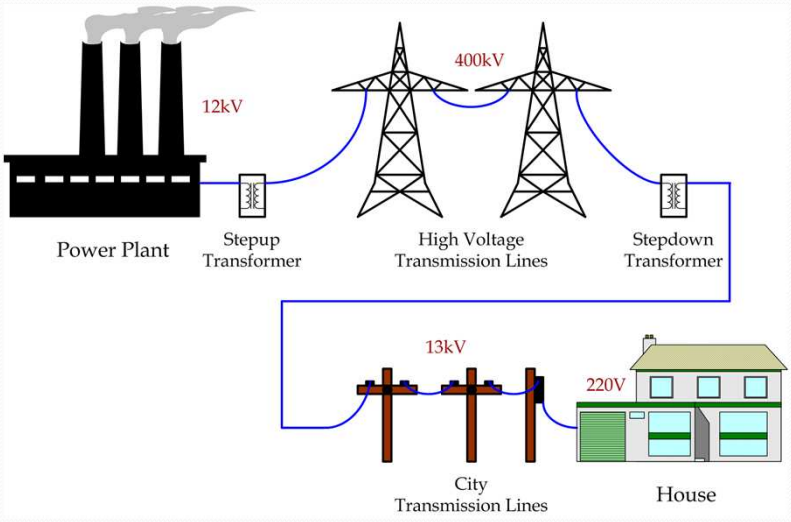
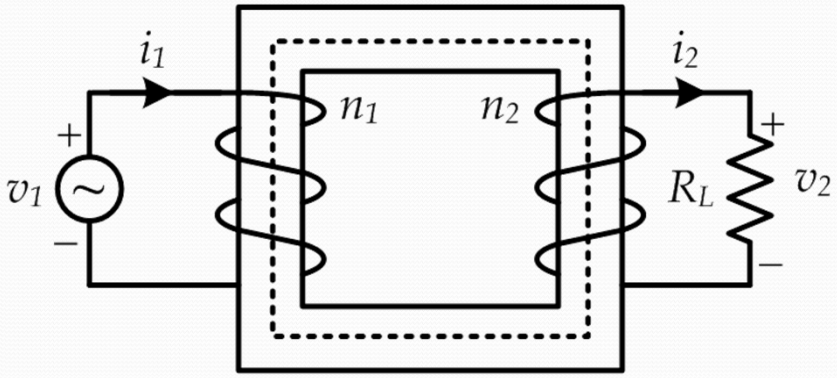
Transformer Circuits

Section 08

Power Transmission



Ideal Transformer



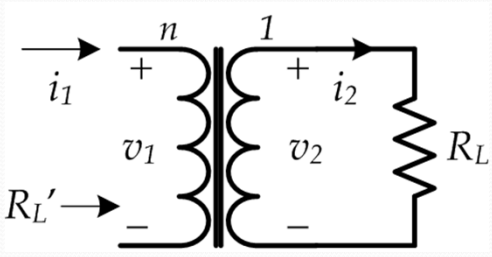
Ideal Transformer Equations

$$v_2 = \frac{v_1}{n}$$

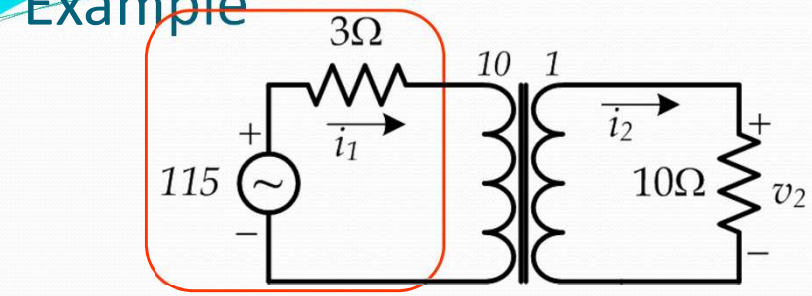
$$i_2 = n \times i_1$$

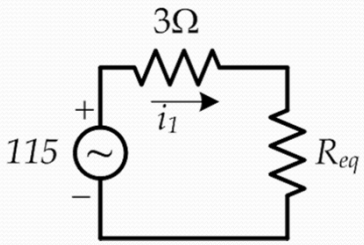
$$R_L^{'} = n^2 \times R_L$$

$$v_1 \cdot i_1 = v_2 \cdot i_2$$



Example

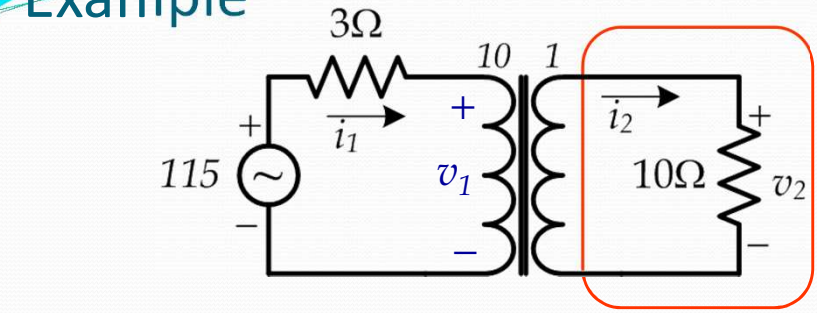


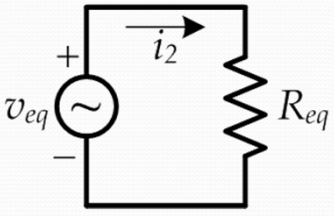


$$R_{eq} = \left(\frac{10}{1}\right)^2 \times 10 = 1000\Omega$$

$$i_1 = \frac{115}{3+1000} = 0.1147A$$

Example





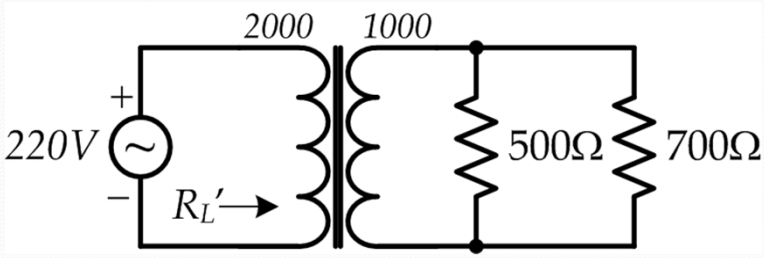
$$v_1 = 115 - i_1 \times 3 = 114.7V$$

$$v_2 = \frac{1}{10} \times v_1 = 11.47V$$

$$i_2 = \frac{11.47}{10} = 1.147A$$

Process Check

- turn ratio of 2000:1000
- Loads: 500Ω and 700Ω.
- What does the source see?



Ideas to solve it?!