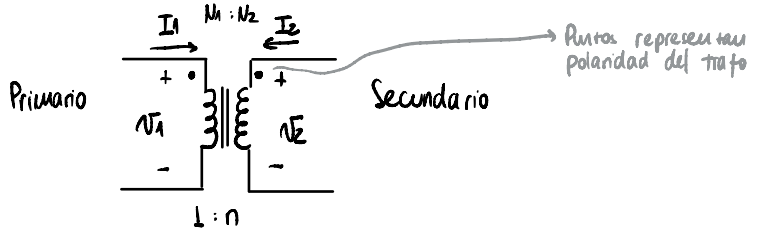
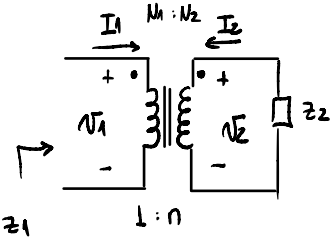
Resumen

- Un transformador (trafo) es un dispositivo eléctrico que utiliza el acople magnético entre 2 inductores para su funcionamiento.
- Fx → Cambiar niveles de corriente y voltaje.
- Trafo ideal no tiene pérdidas y su potencia se mantiene constante, por lo que si aumenta el voltaje, disminuye la corriente y viceversa.
- Modelo circuital:

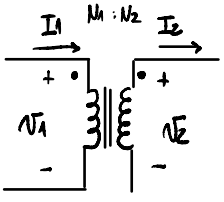


- Razón de transformación: $\frac{N_2}{N_1} = m$

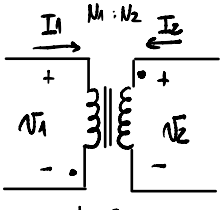
- Algunos casos y ecuaciones:



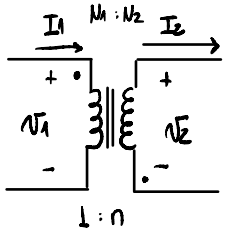
$\frac{V_2}{V_1} = m$; $\frac{I_2}{I_1} = -\frac{1}{m}$ $Z_1 = \frac{1}{m^2} \cdot Z_2$ para todos los casos



$\frac{V_2}{V_1} = m$; $\frac{I_2}{I_1} = \frac{1}{m}$



$\frac{V_2}{V_1} = -m$; $\frac{I_2}{I_1} = \frac{1}{m}$



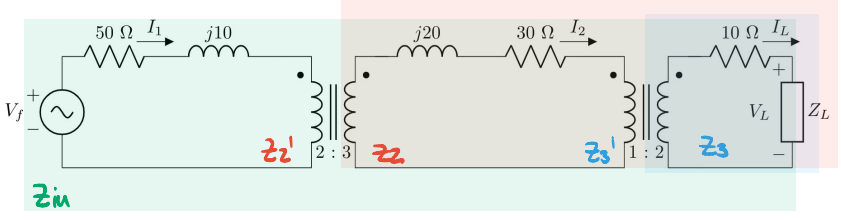
$$\frac{V_2}{V_1} = -M \quad ; \quad \frac{I_2}{I_1} = -\frac{1}{M}$$

P2)

a) $\cos^{-1}(0{,}8) = 36{,}87^\circ$

$$|S| = \frac{P}{0{,}8} = 125 \Rightarrow S = (125 \angle 36{,}87^\circ)\,[VA]$$

$$Z_L = \frac{V^2}{S^*} = \frac{150^2}{(125 \angle 36{,}87)^*} = 143{,}9998 + j \cdot 108{,}0003 \approx 144 + j \cdot 108\ [\Omega]$$



$$Z_3 = 154 + j \cdot 108\ [\Omega]$$

$$Z_3' = \frac{1}{4} \cdot Z_3 = 38{,}5 + j \cdot 27\ [\Omega]$$

$$Z_2 = 68{,}5 + j \cdot 47\ [\Omega]$$

$$Z_2' = \frac{4}{9} \cdot Z_2 = 30{,}4444 + j \cdot 20{,}8889\ [\Omega]$$

$$Z_{in} = 80{,}4444 + j \cdot 30{,}8889\ [\Omega]$$

b) $$I_L = \frac{V_L}{Z_L} = \frac{150}{144 + j \cdot 108} = (0{,}6667 - j \cdot 0{,}5)\,[A]$$

$$I_2 = 2 \cdot I_L$$

$$I_1 = \frac{3}{2} \cdot I_2 = 3 \cdot I_L = 2 - j \cdot 1{,}5\ [A]$$

$$V_f = I_1 \cdot Z_{in} = (207{,}2222 - j \cdot 58{,}8888)\,[V]$$

↳ fasor ⟶ $(215{,}4273 \angle -15{,}86^\circ)\,[V]$