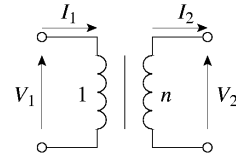


## 理想変成器

結合係数  $k=1$   
励磁インダクタンス  $L_1, L_2 \rightarrow \infty$



通常は巻数比で表記

電流の向きに注意

電圧比は巻数比に等しい :  $V_1 : V_2 = 1 : \pm n$

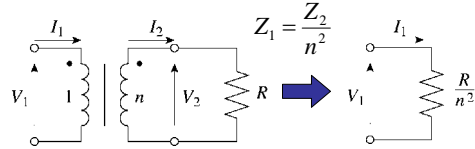
無損失

$$\bar{V}_1 I_1 = \bar{V}_2 I_2 \rightarrow \frac{I_2}{I_1} = \frac{\bar{V}_1}{\bar{V}_2} = \frac{\bar{V}_1}{\pm n \bar{V}_1} = \frac{1}{\pm n}$$

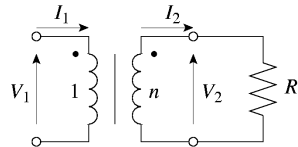
電流比は巻数比の逆数に等しい :  $I_1 : I_2 = 1 : \pm \frac{1}{n}$

インピーダンスは巻数比の2乗で変換される :  $Z_1 : Z_2 = 1 : n^2$

$$\frac{Z_2}{Z_1} = \frac{\frac{V_2}{I_2}}{\frac{V_1}{I_1}} = \frac{V_2}{V_1} \cdot \frac{I_1}{I_2} = (\pm n) \cdot (\pm n) = n^2$$



(例)



$$n = 10, R = 5\Omega, V_1 = 3V$$



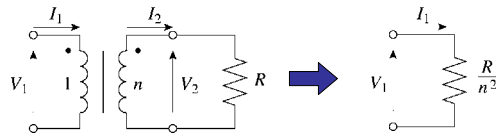
$I_1, I_2, V_2 ?$

$$V_2 = nV_1 = 10 \times 3 = 30V$$

$$I_2 = \frac{V_2}{R} = \frac{30}{5} = 6A$$

$$I_1 = nI_2 = 10 \times 6 = 60A$$

(別解)



$$I_1 = \frac{V_1}{R/n^2} = \frac{3}{5/100} = 60A$$

$$\longrightarrow \begin{cases} V_2 = nV_1 = 10 \times 3 = 30V \\ I_2 = \frac{I_1}{n} = \frac{60}{10} = 6A \end{cases}$$