

To show: $X_{p, pu} = X_{s, pu}$

$$\underbrace{x_1}_{\text{cm}} \quad \underbrace{x'_2 = a^2 x_2}_{\text{cm}} \quad a = \frac{N_1}{N_2}$$

$\left. \begin{array}{c} N_1 \\ \hline N_2 \end{array} \right\} \left\{ \begin{array}{c} N_1 \\ \hline N_2 \end{array} \right.$

Referred to the primary side

$$X_{p, pu} = \frac{x_1 + x'_2}{Z_{p, b}} = \frac{x_1 + a^2 x_2}{\frac{(V_{p, b})^2}{S_b}}$$

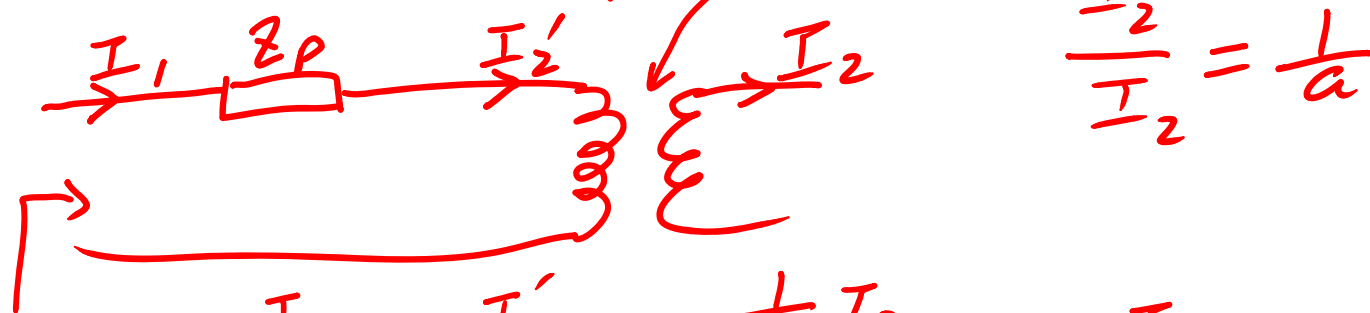
$$\underbrace{x'_1 = \frac{1}{a^2} x_1}_{\text{cm}} \quad \underbrace{x_2}_{\text{cm}}$$

$\left. \begin{array}{c} a \\ \hline 1 \end{array} \right\} \left\{ \begin{array}{c} a \\ \hline 1 \end{array} \right.$

Referred to the secondary side

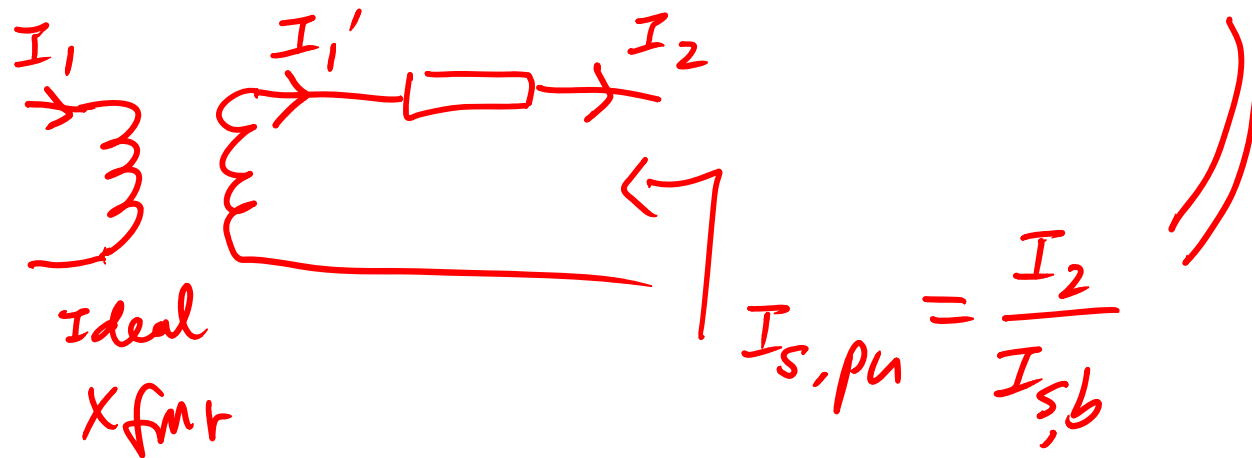
$$X_{s, pu} = \frac{x'_1 + x_2}{Z_{s, b}} = \frac{\frac{1}{a^2} x_1 + x_2}{\frac{(\frac{1}{a} V_{p, b})^2}{S_b}}$$

To show: $I_{p,pu} = I_{s,pu}$ ideal xfr



$$\frac{I_2'}{I_2} = \frac{1}{a}$$

$$I_{p,pu} = \frac{I_1}{I_{p,b}} = \frac{I_2'}{I_{p,b}} = \frac{\frac{1}{a} I_2}{\frac{1}{a} I_{s,b}} = \frac{I_2}{I_{s,b}}$$



$$I_{s,pu} = \frac{I_2}{I_{s,b}}$$