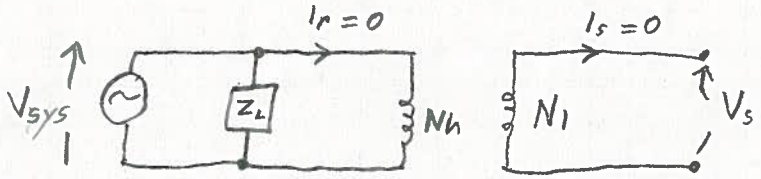
Note: Analysis uses an ideal transformer model which doesn't exist in the real world. It is only meant to illustrate fundamental concepts!



Vt connection with open circuit

V_{sys} = System voltage

V_s = secondary voltage

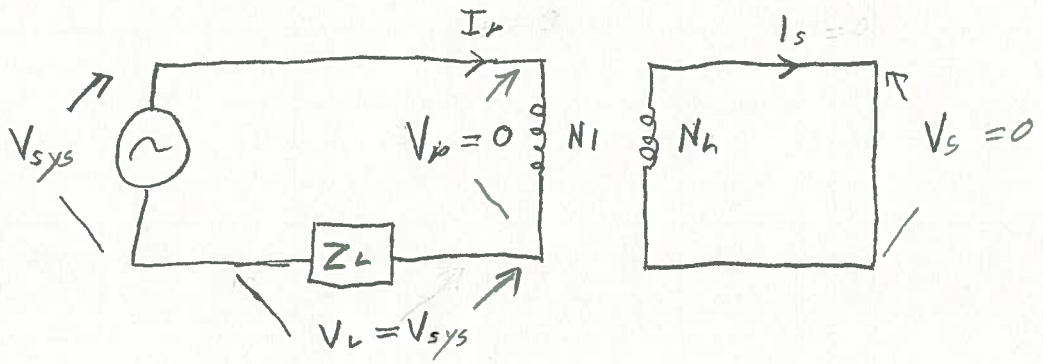
N_h = higher # of winding turns

N_l = lower # of winding turns

Z_L = load impedance

$$V_s = V_{sys} * \left(\frac{N_l}{N_h}\right)$$ or V_s is V_{sys} adjusted down by the Vt turns ratio

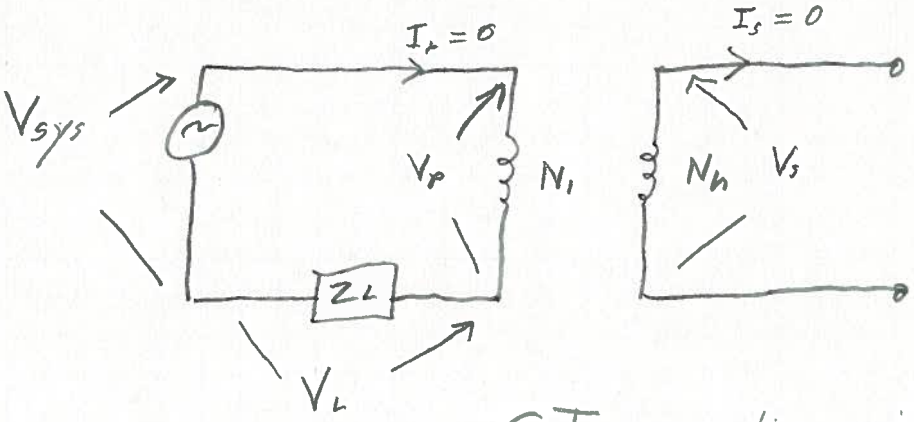
V_L = load voltage, V_p = Ct primary voltage



Ct Connected normally

$I_p = V_p / Z_L$

$I_s = I_p * \frac{N_1}{N_H}$ or $I_s = I_p$ adjusted down by the Ct turns ratio



CT connection with open circuit secondary

$$V_L = I_p * Z_L = 0$$

$$V_L + V_p = V_{sys}$$

$$V_p = V_{sys}$$

$$V_s = V_{sys} * \frac{N_2}{N_1} \quad \text{OR} \quad V_s = \text{System voltage stepped up by the CT turns ratio.}$$