



$$-V_A + V_{AI} - V_{CI} + V_C = 0$$

$$V_A = V_{AI} - V_{CI} + V_C$$

$$V_{AI} = I_A Z_A \quad V_{CI} = I_C Z_C$$

$$V_A = I_A Z_A - I_C Z_C + V_C$$

$$V_A - V_C = I_A Z_A - I_C Z_C$$

$$Z_A = Z_C$$

$$V_A - V_C = I_A Z_A - I_C Z_A$$

$$V_A - V_C = Z_A (I_A - I_C)$$

$$Z_A + Z_C = Z_T \rightarrow Z_T = \text{Total loop impedance}$$

$$Z_A + Z_A = Z_T$$

$$2Z_A = Z_T$$

$$Z_A = \frac{Z_T}{2}$$

$$V_A - V_C = \frac{Z_T}{2} (I_A - I_C)$$

$$\frac{V_A - V_C}{I_A - I_C} = \frac{Z_T}{2}$$

$$\frac{V_{AC}}{I_{AC}} = \frac{Z_T}{2}$$