

$$C = 1 \text{ MF} \Rightarrow \frac{1}{j\omega C} = 10 \text{ k}\Omega$$

$$V = 10 \angle -45^\circ \text{ V}$$

Steady-state

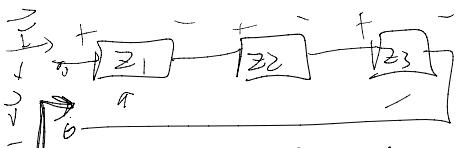
$$\vec{I} = \frac{\vec{V}}{-j10\text{k}\Omega}$$

$$= \frac{10 \angle -45^\circ \text{ V}}{-j10\text{k}\Omega} \checkmark$$

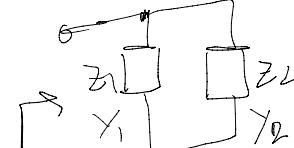
$$\vec{I} = 1 \angle 45^\circ \text{ mA}$$

$$i(t) = 1 \cos(100t + 45^\circ) \text{ mA}$$

Ohm's Law  
KV, KR  
Voltage div  
Current div  
Mesh  
Nodal  
Thevenin  
Superposition  
source transform

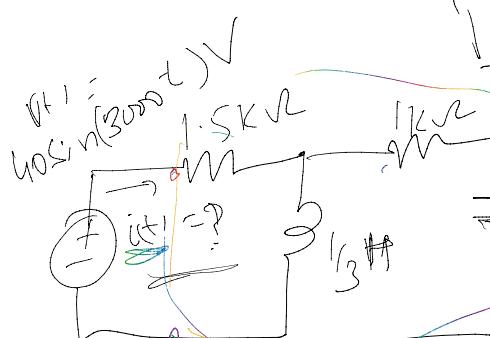


$$Z_{eq} = Z_1 + Z_2 + Z_3$$



$$Z_{eq} = \frac{Z_1 \times Z_2}{Z_1 + Z_2} \checkmark$$

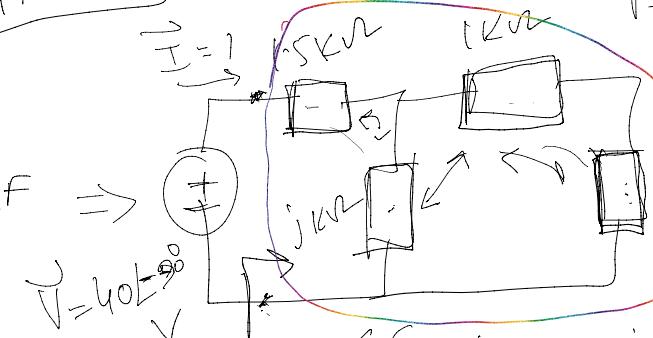
$$Y_{eq} = Y_1 + Y_2$$



$$V = 10 \sin(3000t) \text{ V}$$

$$i(t) = ?$$

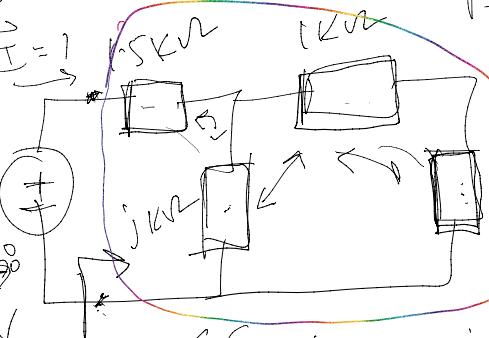
$$Y_3 = 1.5 \text{ k}\Omega$$



$$Y_6 = 1 \text{ k}\Omega$$

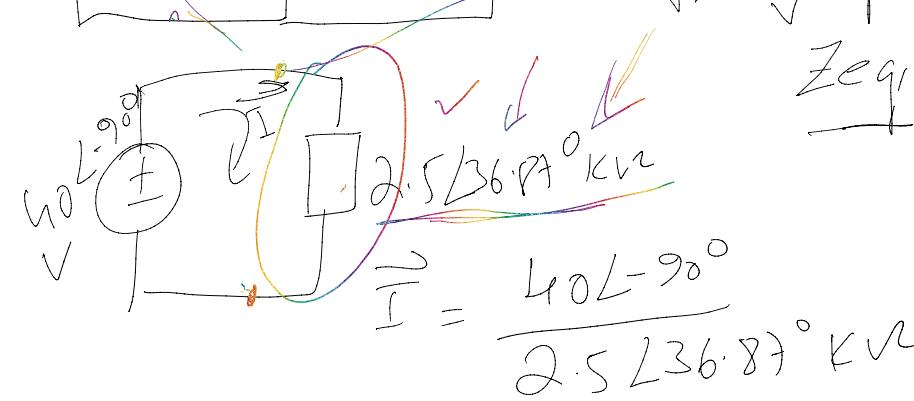
$$I = 1 \text{ A}$$

$$V = 40 \angle 90^\circ \text{ V}$$



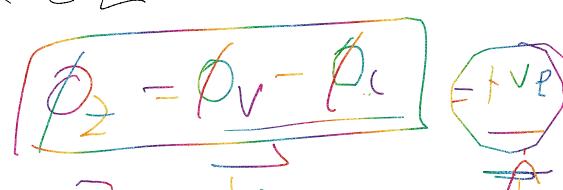
$$Z_{eq1} = \left[ \left( j \parallel (1 - 2j) \right) + 1.5 \right] \text{ k}\Omega$$

$$= 2.5 \angle 36.87^\circ \text{ k}\Omega$$



$$I = \frac{40 \angle 90^\circ}{2.5 \angle 36.87^\circ \text{ k}\Omega}$$

$$= 16 \angle -126.87^\circ \text{ mA}$$



$$\rho_2 = \rho_v - \rho_c$$

$$Z = \frac{V}{I}$$

$i(t) = 16 \cos(3000t - 126.87^\circ) \text{ mA}$



$$I(t) = \frac{V(t)}{Z} + \frac{V(t)}{R} + \frac{V(t)}{L}$$

$$I(t) = I_1 + I_2 + I_3$$

$$I_1 = 5\angle 0^\circ A$$

$$I_2 = 2\cos(3t) A$$

$$I_3 = \left( \frac{-j1.67}{10-j2.33} \right) 5\angle 0^\circ$$

$$= 811.7 \angle -76.86^\circ \text{ mA}$$

$$I' = \left( \frac{-0.4j}{10-1.4j} \right) 2\angle 0^\circ$$

$$= 79.23 \angle -82.03^\circ \text{ mA}$$

$$i(t) = 811.7 \cos(3t - 76.86^\circ) + 79.23 \cos(8t - 82.03^\circ) \text{ mA}$$

