

8-3.

$$100 \angle 0^\circ + A \angle 60^\circ = 175 \angle \varphi$$

$$100 + \frac{1}{2}A + \frac{\sqrt{3}}{2}Aj = 175 \cos \varphi + 175j \sin \varphi$$

$$\begin{cases} 100 + \frac{1}{2}A = 175 \cos \varphi \\ \frac{\sqrt{3}}{2}A = 175 \sin \varphi \end{cases}$$

$$\frac{\sqrt{3}}{2}A = 175 \sin \varphi$$

$$\begin{cases} A = 102.07 \\ \varphi = 30.34^\circ \end{cases}$$

$$\varphi = 30.34^\circ$$

8-7.

$$1) u_1 = 50\sqrt{2} \cos(628t + 30^\circ) V$$

$$u_2 = 100\sqrt{2} \cos(628t + 30^\circ)$$

$$14. \varphi = 30^\circ - 30^\circ = 0$$

8-9.

$$11. \dot{U} = \dot{U}_a + \dot{U}_b + \dot{U}_c$$

$$= 220 \angle 10^\circ (1 + \angle -120^\circ + \angle 120^\circ) = 0$$

$$(2) \dot{U}_{ab} = 220 \angle 10^\circ \angle 120^\circ$$

$$= 220\sqrt{3} \angle 10^\circ - 120^\circ = 220\sqrt{3} \angle 40^\circ$$

$$\dot{U}_{bc} = \dot{U}_b - \dot{U}_c$$

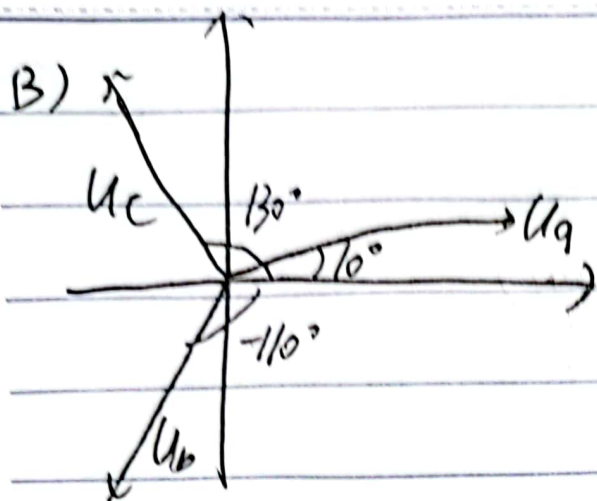
$$= 220 \angle -10^\circ - 220 \angle 130^\circ$$

$$= 220 \angle 250^\circ - 220 \angle 130^\circ$$

$$= 220 \angle 130^\circ (\angle 120^\circ - 1)$$

$$= 220\sqrt{3} \angle 130^\circ \angle 150^\circ = 220\sqrt{3} \angle 280^\circ = 220\sqrt{3} \angle -80^\circ$$





8-13.

$$11). i = 2\sin(10t + 45^\circ + 90^\circ) \\ = 2\cos(10t + 45^\circ)$$

电流电压同相位

\therefore 为电阻

$$12). u = 10\sin(100t - \frac{\pi}{2} + \frac{\pi}{2}) \\ = 10\sin(100t - \frac{\pi}{2})$$

电压相位落后电流 $\frac{\pi}{2}$

\therefore 为电容

$$13). u = 10\cos(t + \pi)$$

$$i = \sin(t + \frac{\pi}{2} + \frac{\pi}{2}) \\ = \cos(t + \frac{\pi}{2})$$

电压领先电流 $\frac{\pi}{2}$

为电感元件

$$14). U = 5\sqrt{2} / 45^\circ$$

$$I = \sqrt{2} / 0^\circ$$



$$Z = \frac{U}{I} = 5 \angle 45^\circ$$

$$= 5 \left(\frac{N_2}{2} + \frac{N_2}{2} j \right)$$

$$= \frac{5N_2}{2} + \frac{5N_2}{2} j$$

∴ 为电阻电感元件组合而成

8-15.

$$I_1 = 10 \angle 0^\circ$$

$$V_R = 100 \angle 0^\circ$$

$$U_C = V_1 \angle 0^\circ$$

$$I_2 = I_C = \frac{U_C}{X_C} = 1 \angle 90^\circ$$

$$\therefore I_2 = 10A, \lambda = 10$$

$$\therefore I_2 = 10 \angle 90^\circ$$

$$I = I_1 + I_2 = 10\sqrt{2} \angle 45^\circ$$

$$U_L = j10 \cdot 10\sqrt{2} \angle 45^\circ$$

$$= 100\sqrt{2} \angle 135^\circ$$

$$U_S = U_L + U_R$$

$$= 100\sqrt{2} \angle 135^\circ + 100 \angle 0^\circ$$

$$= 100 \angle 90^\circ$$

$$= j100V$$

8-18.

当只有 U_S 作用时.

$$U_C = -U_S = -10V$$

$$i_L = \frac{U_S}{R_1} = 10A$$



当只有 i_s 作用时

$$\dot{i}_s = \sqrt{2} \angle 45^\circ$$

$$Z_L = j\omega L = j1 \Omega$$

$$U_C' = 0$$

$$Z' = \frac{j}{j+1}$$

$$U_s = Z \cdot \dot{I}_s$$

$$\dot{i}_L = \textcircled{1} - \frac{U_s}{Z_L} = -\dot{I}_s \frac{1}{1+j} = -\frac{\sqrt{2} \angle 45^\circ}{\sqrt{2} \angle 45^\circ} = -1A$$

$$U_C = 70V$$

$$i_L = [10 - \sqrt{2} \cos(10^4 t)] A$$

8-19.

$$\dot{I}_C = (1-B)\dot{I} \Rightarrow \dot{I} = \frac{\dot{I}_C}{1-B}$$

$$U_C = U_s$$

$$Z_C = \frac{1}{j\omega C}$$

$$U_s = \textcircled{1} U_C = Z_C \cdot \dot{I}_C = \frac{(1-B)\dot{I}}{j\omega C}$$

$$\dot{I} = j \frac{\omega C U_s}{1-B}$$

$$\text{即 } U_C = j \frac{(B-1)\dot{I}}{\omega C}, X_L = \frac{B-1}{\omega C}$$

$B > 1$, 电流 \dot{I} 滞后电压 U_s 90° , ~~电感~~

$B < 1$, 电流 \dot{I} 领先电压 U_s 90° , 即 $U_C = \frac{(1-B)\dot{I}}{j\omega C}$, $X_C = \frac{B}{\omega C} \frac{C}{1-B}$

当 $B=1$, 相当于短路

