

# 正弦量的相量表示      例题



例1 已知电压相量  $\dot{U}_{1m} = (3 - j4)\text{V}$ ,  $\dot{U}_{2m} = (-3 + j4)\text{V}$ ,  $\dot{U}_3 = j4\text{V}$ 。  
写出各电压相量所代表的正弦量（设角频率为  $\omega$ ）。

解:  $U_{1m} = \sqrt{3^2 + (-4)^2} = 5 \text{ V} \quad \psi_1 = \arctan \frac{-4}{3} = -53.1^\circ$

$$\dot{U}_{1m} = 5 \angle -53.1^\circ \text{ V} \quad \rightarrow u_1 = 5 \cos(\omega t - 53.1^\circ) \text{ V}$$

$$U_{2m} = \sqrt{(-3)^2 + 4^2} = 5 \text{ V} \quad \psi_2 = \arctan \frac{4}{-3} = 126.9^\circ$$

$$\dot{U}_{2m} = 5 \angle 126.9^\circ \text{ V} \quad \rightarrow u_2 = 5 \cos(\omega t + 126.9^\circ) \text{ V}$$

$$\dot{U}_3 = j4 \text{ V} = 4 \angle 90^\circ \text{ V} \quad \rightarrow u_3 = 4\sqrt{2} \cos(\omega t + 90^\circ) \text{ V}$$



例2 写出代表正弦量的相量  $i_1 = 3 \cos \omega t \text{ A}$ ,  $i_2 = 4 \cos(\omega t - 150^\circ) \text{ A}$ ,  
 $i_3 = -5 \cos(\omega t - 60^\circ) \text{ A}$ ,  $i_4 = 6 \sin(\omega t + 30^\circ) \text{ A}$ .

解:

$$i_1 \rightarrow \dot{I}_{1m} = 3 \angle 0^\circ \text{ A}$$

$$i_2 \rightarrow \dot{I}_{2m} = 4 \angle -150^\circ \text{ A}$$

$$i_3 = -5 \cos(\omega t - 60^\circ) = 5 \cos(\omega t - 60^\circ + 180^\circ) \text{ A}$$

$$\rightarrow \dot{I}_{3m} = 5 \angle 120^\circ \text{ A}$$

$$i_4 = 6 \sin(\omega t + 30^\circ) = 6 \cos(\omega t + 30^\circ - 90^\circ) \text{ A}$$

$$\rightarrow \dot{I}_{4m} = 6 \angle -60^\circ \text{ A}$$