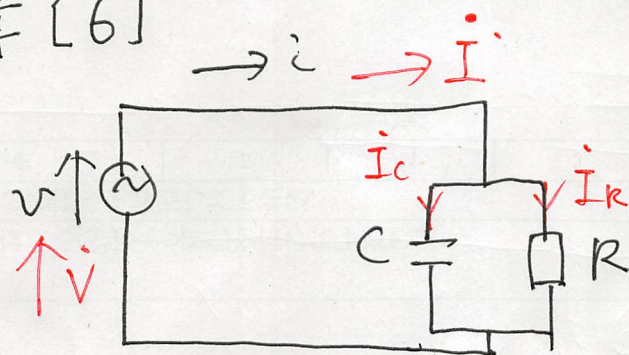


第4章 [6]



$$i = 10\sqrt{2} \sin \omega t \text{ [A]}$$

$$v = 100\sqrt{2} \sin(\omega t - \frac{\pi}{4}) \text{ [V]}$$

まず、複素数表現:

$$\dot{I} = 10 \text{ [A]}$$

$$\dot{V} = 100 e^{j(-\frac{\pi}{4})} = 100(\frac{\sqrt{2}}{2} - j\frac{\sqrt{2}}{2}) \text{ [V]}$$

$$\dot{Z} = \frac{\dot{V}}{\dot{I}} = 5\sqrt{2} - j5\sqrt{2} \text{ [\Omega]}$$

$$\text{一方, } \dot{Z} = \frac{\dot{Z}_1 \cdot \dot{Z}_2}{\dot{Z}_1 + \dot{Z}_2} = \frac{\frac{1}{j\omega C} \cdot R}{\frac{1}{j\omega C} + R} = \frac{\frac{R}{j\omega C} (-\frac{1}{j\omega C} + R)}{R^2 + (\frac{1}{\omega C})^2}$$

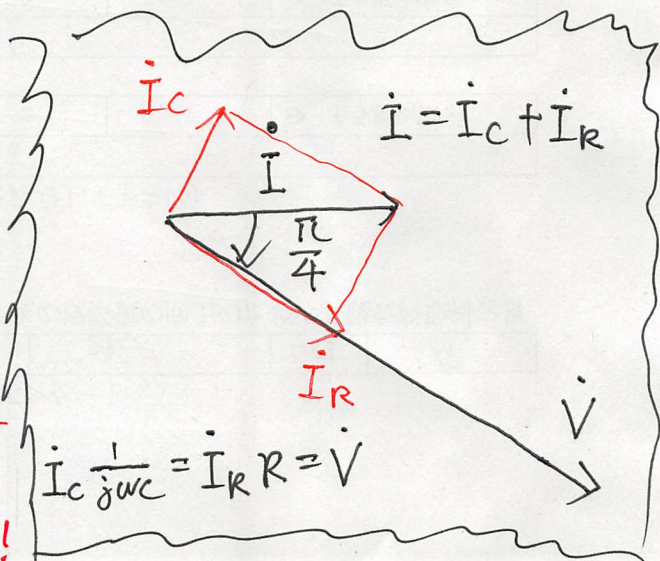
$$(\dot{Z}_1 = \frac{1}{j\omega C}, \dot{Z}_2 = R) = \frac{\frac{R}{(\omega C)^2} - j\frac{R^2}{\omega C}}{R^2 + (\frac{1}{\omega C})^2} = 5\sqrt{2} - j5\sqrt{2} \text{ [\Omega]}$$

$$5\sqrt{2} = \frac{\frac{R}{(\omega C)^2}}{R^2 + (\frac{1}{\omega C})^2} = \frac{\frac{R^2}{\omega C}}{R^2 + (\frac{1}{\omega C})^2}$$

よって, $R = \frac{1}{\omega C}$

$$5\sqrt{2} = \frac{R \times R^2}{R^2 + R^2} = \frac{R}{2}$$

$$R = 10\sqrt{2} \text{ [\Omega]}$$



使わなくてもよいですが、教科書 各章 図 4.3 → 訂正!