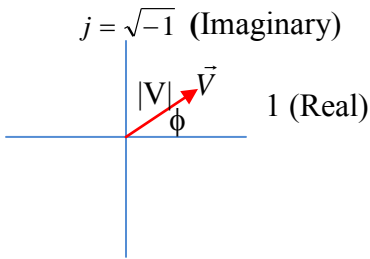


Physics 310
Phasor Practice Problems

Equation List:



$$\tilde{V} = V_{real} + jV_{imaginary} = V \cos \phi + jV \sin \phi = Ve^{j\phi} = V \angle \phi$$

$$V = \sqrt{(V_{real})^2 + (V_{imaginary})^2} \quad \phi = \tan^{-1}(V_{imaginary}/V_{real})$$

$$\tilde{A} + \tilde{B} = (A_R + A_I j) + (B_R + B_I j) = (A_R + B_R) + (A_I + B_I)j$$

$$\tilde{A} \times \tilde{B} = AB e^{j(\phi_A + \phi_B)} = AB \angle (\phi_A + \phi_B)$$

$$\tilde{A}/\tilde{B} = \frac{Ae^{j\phi_A}}{Be^{j\phi_B}} = \frac{A}{B} e^{j(\phi_A - \phi_B)} = A/B \angle (\phi_A - \phi_B)$$

1. Express the following in polar form (length and angle).

(a) $\tilde{A} = 2 + 2j$

(b) $\tilde{B} = -3 + 4j$

2. If $\tilde{C} = 2 + 3j$ and $\tilde{D} = 1 + 2j$, find

(a) $\tilde{C} \times \tilde{D}$

(b) \tilde{C}/\tilde{D}

Answers:

1. (a) $\tilde{A} = \sqrt{8} \angle \frac{\pi}{4} = \sqrt{8} e^{j\frac{\pi}{4}}$

(b) $\tilde{B} = 5 \angle 127^\circ = 5e^{j0.71\pi}$

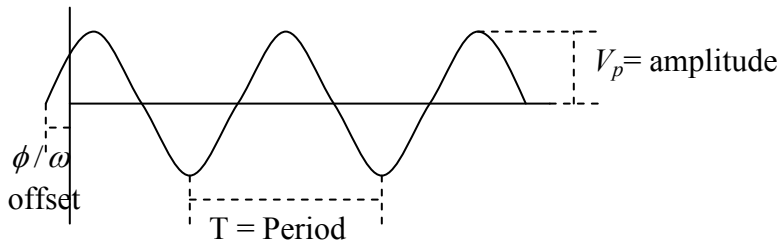
2. (a) $\tilde{C} \times \tilde{D} = 8.06 \angle 120^\circ = 8.06 e^{j\frac{3\pi}{2}}$

(b) $\tilde{C}/\tilde{D} = 1.61 \angle -7.12^\circ = 1.61 e^{-j0.04\pi}$

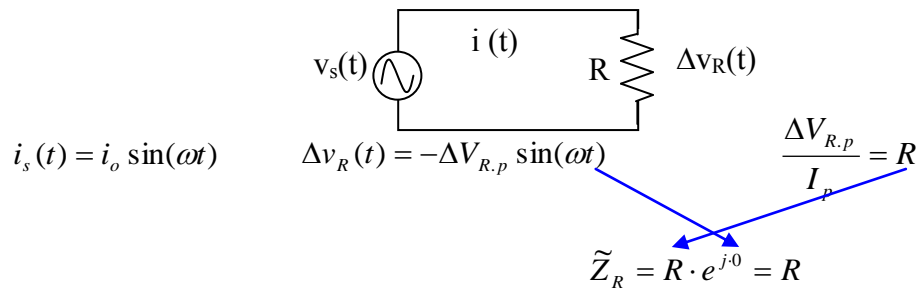
Physics 310 Phasor Practice Problems

Some AC Circuit Basics

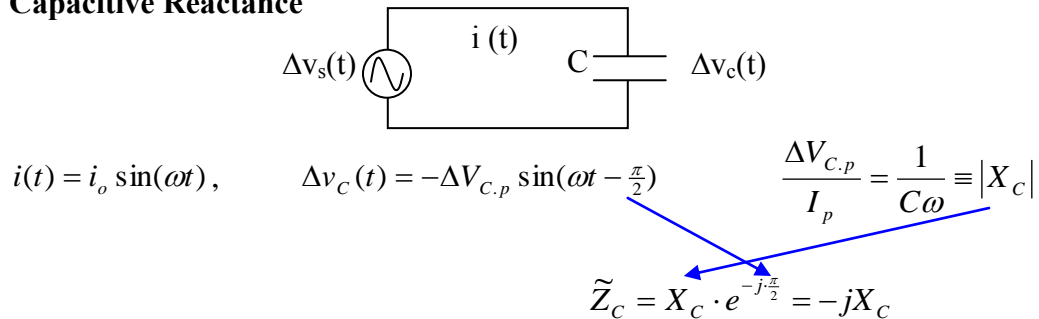
$$v(t) = V_p \sin(\omega t + \phi)$$



AC with a Resistor



Capacitive Reactance



Inductive Reactance

