

PROB: Given

$$v(t) = \cos(2\pi ft) + 3\sqrt{2} \cos(2\pi ft + 45^\circ),$$

express $v(t)$ in polar form

$$v(t) = A \cos(2\pi ft + \phi).$$

That is, find the values of A and ϕ .

$$A = \underline{\hspace{2cm}} \quad \phi = \underline{\hspace{2cm}}$$

Hint: Use the following helpful identities with $\theta = 2\pi ft$:

$$\cos(\theta + \psi) = \cos\theta \cos\psi - \sin\theta \sin\psi$$

$$a \cos\theta + b \sin\theta = \sqrt{a^2 + b^2} \cdot \cos\left(\theta - \tan^{-1} \frac{b}{a}\right)$$