
Quiz: What are the amplitude A , circular frequency ω , and phase lag ϕ when

$$\cos(\omega t) + \sqrt{3} \sin(\omega t)$$

is converted to amplitude-phase form $A \cos(\omega t - \phi)$?

Think about your answer and then look at the choices.

Choices:

- a) $2 \cos(\omega t - \frac{\pi}{4})$
- b) $\sqrt{3} (\cos(\omega(t - \frac{\pi}{3})))$
- c) $2 \cos(\omega(t - \frac{\pi}{3}))$
- d) $2 \cos(\omega(t + \frac{\pi}{3}))$
- e) $\sqrt{3} (\cos(\omega t - \frac{\pi}{3}))$
- f) $\sqrt{3} (\cos(\omega t - \frac{\pi}{4}))$
- g) Don't know.

Pick what you think is the correct choice and then look at the answer.

Answer:

The answer is (d) because $A = \sqrt{1^2 + \sqrt{3}^2} = 2$, and $\phi = \tan^{-1} \frac{\sqrt{3}}{1} = \frac{\pi}{3}$.

Is this correct? I feel like ϕ shouldn't be inside parentheses. Also, check the sign. (Maybe there's an error in sess7.3.tex or maybe I'm missing something.) – HB