

# Question 1

Suppose that

$$z(t) = C \cos(\omega t + \phi) + iC \sin(\omega t + \phi)$$

is written as

$$Z(t) = D e^{i\omega t}.$$

Which of the following is true?

1.  $D = C$
2.  $D = C \cos \phi$
3.  $D = C e^{-i\phi}$
4.  $D = C e^{+i\phi}$
5. There is no such  $D$  that works.

## Question 2

The motion of a simple harmonic oscillator is represented by

$$z(t) = (1 + \sqrt{3}i) e^{i12\pi t}.$$

Which of the following is the amplitude of the oscillation?

1. 1
2.  $\sqrt{3}$
3. 2
4. 4
5. 12

## Question 3

A simple harmonic oscillator is represented by

$$z(t) = -ie^{i\omega t}.$$

Which of the following is true?

1. Amplitude =  $-1$ , phase =  $0$ .
2. Amplitude =  $-1$ , phase =  $\pi/2$ .
3. Amplitude =  $1$ , phase =  $0$ .
4. Amplitude =  $1$ , phase =  $\pi/2$ .
5. Amplitude =  $1$ , phase =  $3\pi/2$ .