

15-Phys-202
S 2002

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Quiz 1

Name _____

1. A body oscillates with a simple harmonic motion

$$x = (6.0 \text{ m}) \cos [(3\pi \text{ rad/s}) t + \pi/3 \text{ rad}]$$

At $t = 2.0 \text{ s}$, what are

- (a) the displacement

$$x = (6.0) \cos \left[(3\pi) (2.0) + \frac{\pi}{3} \right] = 3.0 \text{ m}$$

- (b) the velocity

$$v = \frac{dx}{dt} = - (3\pi) (6.0) \sin \left[(3\pi) (2.0) + \frac{\pi}{3} \right] = -49 \text{ m/s}$$

- (c) the phase of the motion

$$(3\pi) (2.0) + \frac{\pi}{3} = \frac{19\pi}{3} \approx 20 \text{ rad}$$

Also, what are

- (d) the frequency

$$\omega = 3\pi \text{ rad/s}$$
$$f = \frac{\omega}{2\pi} = 1.5 \text{ Hz}$$

- (e) the period of the motion

$$T = \frac{1}{f} \approx 0.67 \text{ s}$$