Question

Which equation can be used to model simple harmonic motion?

$d = a\cos(\omega t)$

$d = a\sin(\omega t) + k$

$d = a\cos[\omega(t + k)]$

$d = \sin(a\omega t)$

Answer: $d = A\cos(\omega t)$.

Question

For the simple harmonic motion equation $d = 5\sin\left(\frac{\pi}{4}t\right)$, what is the maximum displacement from the equilibrium position?_____

Solution

For the simple harmonic motion equation $d = 5\sin(\frac{\pi}{4} * t)$,

the amplitude is A = 5, so the maximum displacement from the equilibrium position is 5.

Answer: 5.

Question

For the simple harmonic motion equation $d = 5\sin\left(\frac{\pi}{4}t\right)$, what is the period?

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Solution

$$d = 5\sin\left(\frac{\pi}{4} * t\right), \quad T = \frac{2\pi}{w}, \quad w = \frac{\pi}{4}.$$

Period is $T = \frac{2\pi}{\frac{\pi}{4}} = 8\ s.$

Answer: $8\ s.$