Question

Which of the following is an example of simple harmonic motion?

A ball bouncing on a sidewalk

Calculating the angle of elevation for a building

A police car shining a spotlight into buildings as it drives by

The motion of a rotating beacon

Answer: The motion of a rotating beacon.

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

Range of $sin(x)$ is $E(\sin x) = [-1; 1]$, range of $5\sin\left(\frac{\pi}{4}x\right)$ is $E\left(5\sin\left(\frac{\pi}{4}x\right)\right) = [-5; 5]$, hence 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?_____

Solution

$$T = \frac{2\pi}{\frac{\pi}{4}} = \frac{2\pi \cdot 4}{\pi} = 8.$$

Answer: 8.