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Instructor: Uvic Math
Course: MATH 100 (A01, A02, A03) Fall **Assignment:** Assignment 6
 2021

Given the velocity $v = \frac{ds}{dt}$ and initial position of a body moving along a coordinate line, find the body's position at time t .

$$v = \sin(\pi t), \quad s(-5) = 0$$

A corollary to the Mean Value Theorem states if $f'(x) = g'(x)$ at each point in an open interval (a, b) , then there exists a constant C such that $f(x) = g(x) + C$ for all $x \in (a, b)$. That is, $f - g$ is a constant on (a, b) .

Find the trigonometric function that has the derivative $v = \sin \pi t$.

$$s = -\frac{\cos \pi t}{\pi}$$

(Type an exact answer.)

Thus, the function $s = -\frac{\cos(\pi t)}{\pi} + C$, for some constant C .

Use the initial position to find C .

$$0 = -\frac{\cos(\pi t)}{\pi} + C$$

$$C = -\frac{1}{\pi}$$

(Type an exact answer.)

The body's position at time t is $s = -\frac{\cos \pi t}{\pi} - \frac{1}{\pi}$.

YOU ANSWERED: $\frac{\cos \pi t}{\pi}$