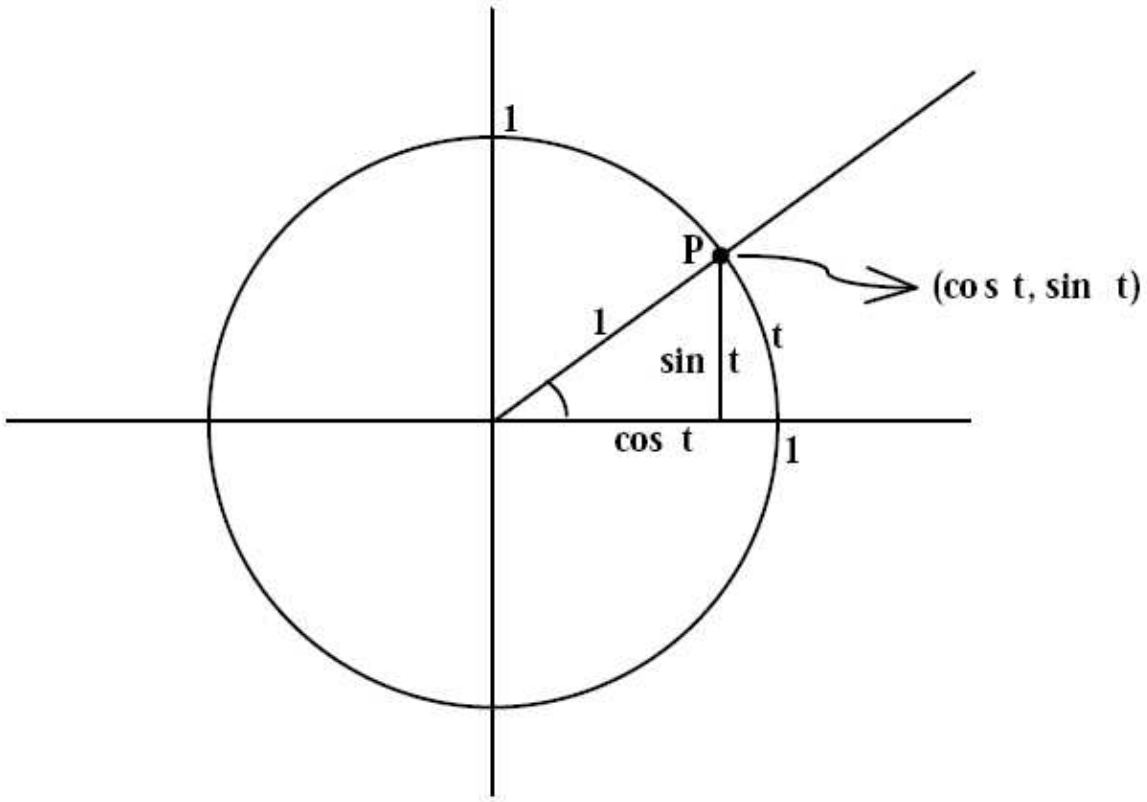
Trigonometric Functions



Theorem 1. *The trigonometric functions sin and* cos *are defined for all real values of* t*, and are periodic with period* 2*. I.e. they satisfy* $sin(t + n \cdot 2\pi) = sint$ *for any real* t *and any integer* n*.*

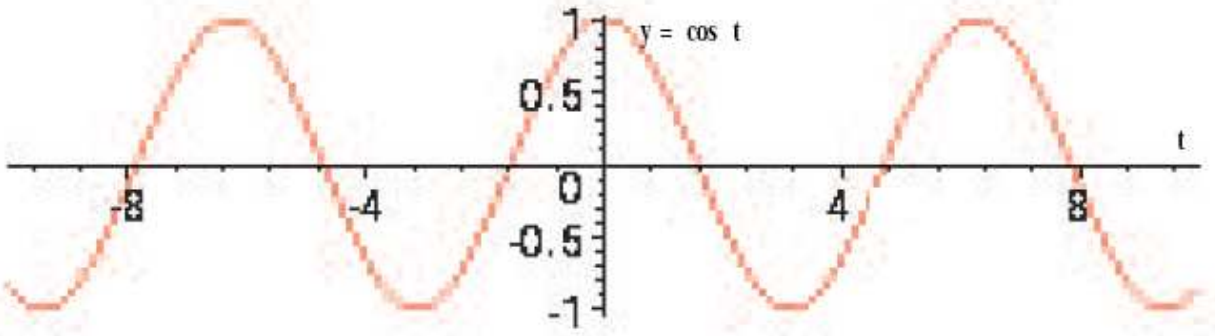
Properties

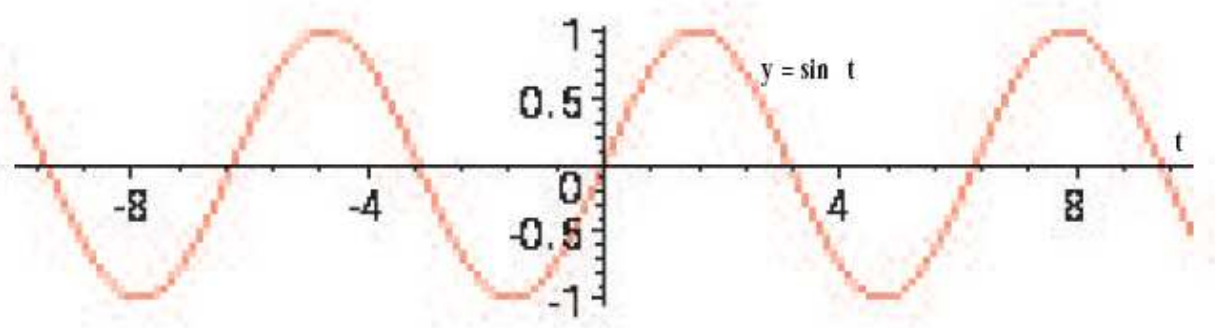
- $\sin^2(t) + \cos^2(t) = 1.$
- $\cos(-t) = \cos(t).$
- $\sin(-t) = -\sin(t)$
- $\cos(0) = 1, \cos(\pi/2) = 0, \cos(\pi) = -1.$
- $\sin(0) = 0, \sin(\pi/2) = 1.$

More Properties

- $\cos(\pi - t) = -\cos t.$
- $\sin(\pi - t) = \sin t.$
- $\cos(\pi/2 - t) = \sin t.$
- $\sin(\pi/2 - t) = \cos t.$

Graphs of trigonometric functions





Other trigonometric functions

Definition 1. *Other trigonometric functions:*

$$\begin{aligned} \tan t &= \frac{\sin t}{\cos t}, \quad \cot t = \frac{1}{\tan t} = \frac{\cos t}{\sin t}, \\ \sec t &= \frac{1}{\cos t}, \quad \csc t = \frac{1}{\sin t}. \end{aligned}$$

Graph of $\tan t$