

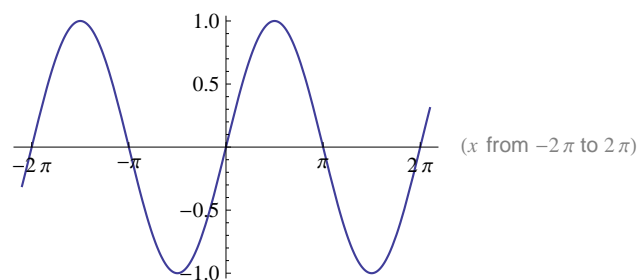
sin



Input:

$\sin(x)$

Plots:



Alternate form:

$$\frac{1}{2} i e^{-ix} - \frac{1}{2} i e^{ix}$$

Property:

Periodic in x with period 2π

Root:

$$x = \pi n, \quad n \in \mathbb{Z}$$

Series expansion at :x == 0:

$$x - \frac{x^3}{6} + \frac{x^5}{120} + O(x^7)$$

Derivative:

$$\frac{d}{dx}(\sin(x)) = \cos(x)$$

Indefinite integral:

$$\int \sin(x) dx = -\cos(x) + \text{constant}$$

Global maximum:

$$\max \{\sin(x)\} = 1 \quad \text{at} \quad x = \frac{\pi}{2}$$

Global minimum:

$$\min \{\sin(x)\} = -1 \quad \text{at} \quad x = \frac{3\pi}{2}$$

Alternative representations:

$$\sin(x) = \frac{1}{\csc(x)}$$

Series representations:

$$\sin(x) = \sum_{k=0}^{\infty} \frac{(-1)^k x^{1+2k}}{(1+2k)!}$$

Integral representations:

$$\sin(x) = x \int_0^1 \cos(tx) dt$$

Definite integral over a half-period:

$$\int_0^\pi \sin(x) dx = 2$$

Definite integral mean square:

$$\int_0^{2\pi} \frac{\sin^2(x)}{2\pi} dx = \frac{1}{2}$$