

Trigonometry

1 Basics

$$\cos(-x) = \cos x \quad (1)$$

$$\sin(-x) = -\sin x \quad (2)$$

$$\sin(x) = \cos\left(x - \frac{\pi}{2}\right) \quad (3)$$

$$\sec x = \frac{1}{\cos x} \quad (4)$$

$$\csc x = \frac{1}{\sin x} \quad (5)$$

$$\cot x = \frac{1}{\tan x} \quad (6)$$

2 Identities

$$\sin^2 x + \cos^2 x = 1 \quad (7)$$

$$\sin(x + y) = \sin(x) \cos(y) + \cos(x) \sin(y) \quad (8)$$

$$\sin(x - y) = \sin(x) \cos(y) - \cos(x) \sin(y) \quad (9)$$

$$\cos(x + y) = \cos(x) \cos(y) - \sin(x) \sin(y) \quad (10)$$

$$\cos(x - y) = \cos(x) \cos(y) + \sin(x) \sin(y) \quad (11)$$

$$e^{\pm ix} = \cos x \pm i \sin x \quad (12)$$

$$\cos x = \frac{e^{ix} + e^{-ix}}{2} \quad (13)$$

$$\sin x = \frac{e^{ix} - e^{-ix}}{2i} \quad (14)$$

3 Derivatives

$$\frac{d}{dx} \sin x = \cos x \quad (15)$$

$$\frac{d}{dx} \cos x = -\sin x \quad (16)$$

$$\frac{d}{dx} \tan x = \sec^2 x \quad (17)$$

$$\frac{d}{dx} \arcsin x = \frac{1}{\sqrt{1-x^2}} \quad (18)$$

$$\frac{d}{dx} \arccos x = \frac{-1}{\sqrt{1-x^2}} \quad (19)$$

$$\frac{d}{dx} \arctan x = \frac{1}{\sqrt{1+x^2}} \quad (20)$$