

Trigonometric Identities

$$\sin^2 x + \cos^2 x = 1$$

$$\tan^2 x + 1 = \sec^2 x$$

$$1 + \cot^2 x = \csc^2 x$$

$$\cos(2x) = \cos^2 x - \sin^2 x = 1 - 2\sin^2 x = 2\cos^2 x - 1$$

$$\sin(2x) = 2\sin x \cos x$$

$$\frac{1}{2} \sin 2x = \sin x \cos x$$

$$\sin A \cos B = \frac{1}{2} \sin(A+B) + \sin(A-B)$$

Relationship between $\sin x$ and $\sinh x$

If we take a look at the equation

$$\frac{\sin x}{\cos x}$$

$$\cos x$$

We get

$$\frac{\sin x}{\pm \sqrt{1 - \sin^2 x}} = \sinh x$$

$$\sin^2 x = \frac{\sinh^2 x}{1 + \sinh^2(x)}$$