

Trigonometric Formulas

Triangle Identities

In Triangle $\triangle ABC$ (not necessarily a right triangle) with corresponding sides abc , the following identities hold:

Law of Sines:

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

Law of Cosines:

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$c^2 = a^2 + b^2 - 2ab \cos C$$

Basic Identities

$$\sec \theta = \frac{1}{\cos \theta}, \quad \csc \theta = \frac{1}{\sin \theta}, \quad \cot \theta = \frac{1}{\tan \theta}$$

$$\tan \theta = \frac{\sin \theta}{\cos \theta}, \quad \cot \theta = \frac{\cos \theta}{\sin \theta}$$

Pythagorean Identities

$$(\sin \theta)^2 + (\cos \theta)^2 = 1$$

$$(\tan \theta)^2 + 1 = (\sec \theta)^2$$

$$1 + (\cot \theta)^2 = (\csc \theta)^2$$