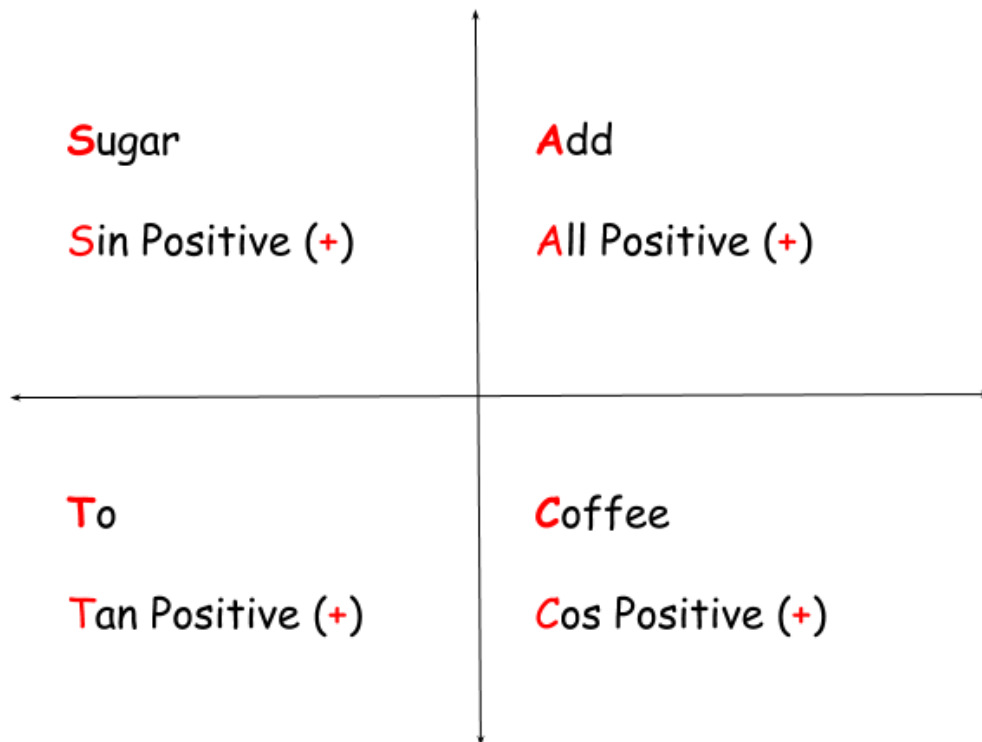


# Trigonometry Formulas

## Trigonometry Formulas For Class 10

Trigonometry is an important part of math. Trigonometry is important in terms of board examination. Therefore, to solve the problems of trigonometry, it is necessary to remember the formulas. For this reason, in this article of All Trigonometry Formulas For Class 10, 11, 12, we have shown how to remember through logic.

### Sine, Cosine, and Tangent



Quadrant	I	II	III	IV
Sin	+	+	-	-
Cos	+	-	-	-
Tan	+	-	+	-

### Trigonometric Ratio

In a right-angled triangle, the opposite side of a given angle is perpendicular, the opposite side of the right angle is the hypotenuse and the third side is the base.

In  $\triangle ABC$ ,

$$\angle A = 90^\circ, \angle C = \theta$$

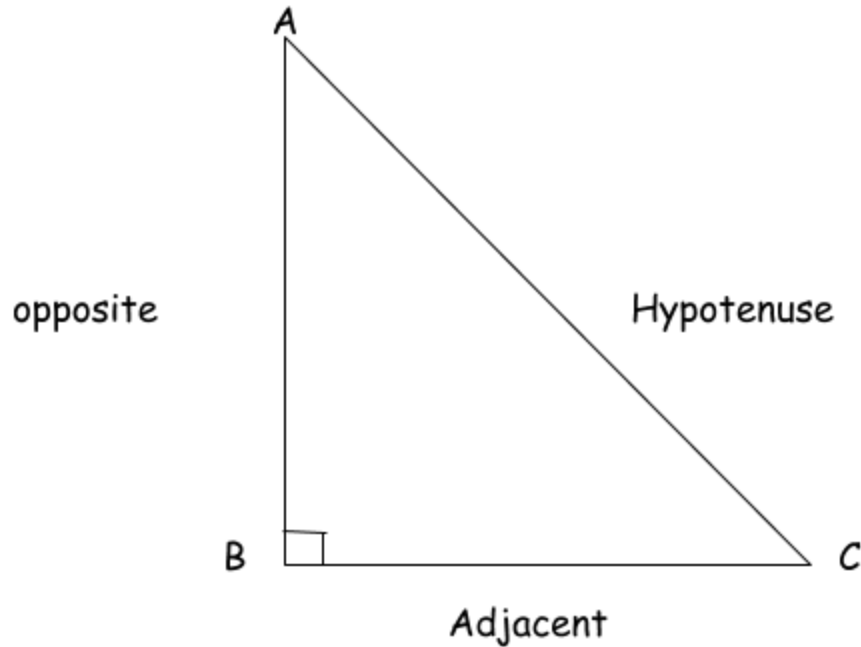
$\therefore$  The side AC is the hypotenuse,

AB is perpendicular

and BC is the base.

From the Pythagoras theorem,

$$\text{Hypotenuse}^2 = \text{opposite}^2 + \text{adjacent}^2$$



## Relationship between arms and angles

Finding the formulas of cosec, sec, and cot can be obtained by reversing the formulas of sin, cos, and tan

This means that the formula of cosec will be the inverse of sin, the formula of sec will be the inverse of cos, the formula of cot will be inverse of tan. The numerator is replaced by the denominator and denominator.

**Trigonometric ratios of sine, cosine, and tangent from  $0^\circ$  to  $90^\circ$ .**

Angle	Sin $\theta$	Cos $\theta$	Tan $\theta$
$0^\circ$	0	1	0
$30^\circ$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$
$45^\circ$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1
$60^\circ$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
$90^\circ$	1	0	$\infty$

Trigonometric ratios of sine, cosine, and tangent from 120 to 180.

Angle	Sin $\theta$	Cos $\theta$	Tan $\theta$
$120^\circ$	$\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$-\sqrt{3}$
$135^\circ$	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	-1
$150^\circ$	$\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{1}{\sqrt{3}}$
$180^\circ$	0	-1	0

Trigonometric ratios of cosec, sec, and the cot from 0 to 90.

Angle	Cosec $\theta$	Sec $\theta$	Cot $\theta$
$0^\circ$	$\infty$	1	$\infty$
$30^\circ$	2	$\frac{2}{\sqrt{3}}$	$\sqrt{3}$
$45^\circ$	$\sqrt{2}$	$\sqrt{2}$	1
$60^\circ$	$\frac{2}{\sqrt{3}}$	2	$\frac{1}{\sqrt{3}}$
$90^\circ$	1	$\infty$	0

Trigonometric ratios of cosec, sec, and the cot from 120 to 180.

Angle	Cosec $\theta$	Sec $\theta$	Cot $\theta$
$120^\circ$	$\frac{2}{\sqrt{3}}$	-2	$-\frac{1}{\sqrt{3}}$
$135^\circ$	$\sqrt{2}$	$-\sqrt{2}$	-1
$150^\circ$	2	$-\frac{2}{\sqrt{3}}$	$-\sqrt{3}$
$180^\circ$	$\infty$	-1	$\infty$

### The trigonometrical function of the sum

There are definite relations between trigonometric functions of two angles of a triangle.

In this article, “Trigonometry Formulas For Class 10” of math is given. It is based on these relations, especially their sum and difference.

$$\sin \theta = \frac{\textit{opposite}}{\textit{hypotenus}} = \frac{AB}{AC} = \frac{1}{\textit{cosec}\theta}$$

$$\cos \theta = \frac{\textit{Ajacent}}{\textit{hypotenus}} = \frac{BC}{AC} = \frac{1}{\textit{sec}\theta}$$

$$\tan \theta = \frac{\textit{opposite}}{\textit{Adjacent}} = \frac{AB}{BC} = \frac{1}{\textit{cot}\theta}$$

$$\sin \theta = \frac{1}{\textit{cosec}\theta} \Rightarrow \textit{cosec}\theta = \frac{1}{\textit{sin}\theta}$$

$$\cos \theta = \frac{1}{\textit{sec}\theta} \Rightarrow \textit{sec}\theta = \frac{1}{\textit{cos}\theta}$$

$$\tan \theta = \frac{\textit{sin}\theta}{\textit{cos}\theta} \Rightarrow \textit{cot}\theta = \frac{\textit{cos}\theta}{\textit{sin}\theta}$$

$\sin \theta$	$\frac{\text{opposite}}{\text{hypotenuse}}$	$\frac{1}{\text{cosec}\theta}$	$\sin\theta\cos\theta$
$\cos\theta$	$\frac{\text{Adjacent}}{\text{hypotenuse}}$	$\frac{1}{\text{sec}\theta}$	$\frac{\tan\theta}{\sin\theta}$
$\tan\theta$	$\frac{\text{opposite}}{\text{Adjacent}}$	$\frac{1}{\text{cot}\theta}$	$\frac{\sin\theta}{\cos\theta}$
$\text{cot}\theta$	$\frac{\text{Adjacent}}{\text{opposite}}$	$\frac{1}{\tan\theta}$	$\frac{\cos\theta}{\sin\theta}$
$\text{Sec}\theta$	$\frac{\text{hypotenuse}}{\text{Adjacent}}$	$\frac{1}{\cos\theta}$	$\frac{\sin\theta}{\tan\theta}$
$\text{Cosec}\theta$	$\frac{\text{hypotenuse}}{\text{Adjacent}}$	$\frac{1}{\sin\theta}$	$\frac{1}{\sin\theta\tan\theta}$

### Ratios Of Particular Angle Trigonometry Formulas For Class 10

The ratio formula of trigonometry is very important from this point of view. Which is important for all classes of students. In The Ratio Trigonometry Formulas For Class 10, you can remember sin, cos, and tan value. and the other three are opposite like this sin is to Reverse cosec. cos is Reverse to sec and tan Reverse to cot

$$\sin (A + B) = \sin A \cos B + \cos A \sin B$$

$$\sin (A - B) = \sin A \cos B - \cos A \sin B$$

$$\cos (A + B) = \cos A \cos B - \sin A \sin B$$

$$\cos (A - B) = \cos A \cos B + \sin A \sin B$$

**The Trigonometrical function of different**

$$\tan (A + B) = \frac{\tan A + \tan B}{1 + \tan A \tan B}$$

$$\tan (A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

$$\cot (A + B) = \frac{\cot A \times \cot B - 1}{\cot A + \cot B}$$

$$\cot (A - B) = \frac{\cot A \times \cot B + 1}{\cot B - \cot A}$$

**The Multiplication Of different of two angle**



$$\begin{aligned}\sin(A + B) \sin(A - B) &= \sin^2 A - \sin^2 B \\ &= \cos^2 B - \cos^2 A\end{aligned}$$

$$\begin{aligned}\cos(A + B) \cos(A - B) &= \cos^2 A - \sin^2 B \\ &= \cos^2 B - \sin^2 A\end{aligned}$$

## **Trigonometric Functions And Form**

$$\sin C + \sin D = 2 \frac{\sin(C+D)}{2} \frac{\cos(C-D)}{2}$$

$$\sin C - \sin D = 2 \frac{\cos(C+D)}{2} \frac{\sin(C-D)}{2}$$

$$\cos C + \cos D = 2 \frac{\cos(C+D)}{2} \frac{\cos(C-D)}{2}$$

$$\cos C - \cos D = 2 \frac{\sin(C+D)}{2} \frac{\sin(D-C)}{2}$$

$$2 \sin A \cos B = \sin(A+B) + \sin(A-B)$$

$$2 \cos A \sin B = \sin(A+B) - \sin(A-B)$$

$$2 \sin A \sin B = \cos(A-B) - \cos(A+B)$$

$$\sin 2A = 2 \sin A \cos A = \frac{2 \tan A}{1 + \tan^2 A}$$

$$\cos 2A = \cos^2 A - \sin^2 A = 1 - 2 \sin^2 A$$

$$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

$$\cot 2A = \frac{\cot^2 A - 1}{\cot A}$$

A A

### Sum of squares of angles

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

$$\cos^2 A = 1 - \sin^2 A$$

$$\sin^2 A = 1 - \cos^2 A$$

$$\sec^2 A - \tan^2 A = 1$$

$$\tan^2 A = \sec^2 A - 1$$

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

$$\cot^2 A - \operatorname{cosec}^2 A = -1$$

$$\cot^2 A = \operatorname{cosec}^2 A - 1$$

$$\operatorname{cosec}^2 A = \cot^2 A + 1$$

### Three angle formulas

$$\sin 3A = 3 \sin A - 4 \sin^3 A$$

$$\cos 3A = 4 \cos^3 A - 3 \cos A$$

$$\tan 3A = \frac{3 \tan A - \tan^3 A}{1 - 3 \tan^2 A}$$

$$\cot 3A = \frac{3 \cot A - \cot^3 A}{3 \cot^2 A - 1}$$

### Half Angle Identities

$$\sin \left( \frac{A}{2} \right) = \mp \sqrt{\left( \frac{1 - \cos A}{2} \right)}$$

$$\cos \left( \frac{A}{2} \right) = \mp \sqrt{\left( \frac{1 + \cos A}{2} \right)}$$

$$\tan \left( \frac{A}{2} \right) = \frac{\sin A}{1 + \cos A} = \frac{1 - \cos A}{\sin A}$$

