

How to Learn Trigonometry Formulas Class XII: Shortcuts & Tips

Trigonometry is the study of the relationship between angles, sides and triangles. Mainly used by voyagers and sea captains in the ancient days, it is now used in the field of engineering, architecture, physics, astronomy, geography and many other fields. Trigonometry or trigonometric Functions is one of the most important chapters in the Class XII Mathematics syllabus. Sometimes students also claim this as one of the toughest chapters for them. There are trigonometric ratios, functions and formulas that a student needs to memorize in order to solve trigonometric problems. While these functions and formulas may seem quite tough with the right mindset and some tricks you can easily learn these in no time. Here are some tips you can add to your routine to memorize Trigonometry formulas easily

Comprehend the basic concept of the formula: Before approaching to memorize any formula understand the basic concept. Make sure you thoroughly figure out the questions like what is the formula about? How does it work? What is it used for? Like in Trigonometry, understand the function of angles and how they are applied. There are six basic functions Sine (Sin), Cosine (Cos), Tangent (Tan), Cotangent (Cot), Secant (Sec) and Cosecant (Csc). Know that trigonometric functions are used in calculating the distance between known points and calculating unknown angles.

Use Mnemonics: If you don't know what mnemonics is, it is a way of memorizing something by making an acronym, song, rhyme etc. And if you are not used to using mnemonic devices to memorize formulas and other facts then you are not studying right. Using mnemonics in trigonometry serves a great help.

Use this '**Pandit badri prasad har har bole sona chandi tole**' to memorize trigonometric ratios

$$\frac{p(\text{pandit})}{h(\text{har})} = \text{Sin}(\text{Sona}), \frac{b(\text{badri})}{h(\text{har})} = \text{Cos}(\text{Chandi}), \frac{p(\text{prasad})}{b(\text{bole})} = \text{tan}(\text{tole})$$

Practice: It is a known fact that mathematics is a subject learnt with practice and not by mugging up. Practice, practice and practice, problems which require the formulas that you are trying to memorize. The more you practice, the more quickly and easily you memorize. Practice all kinds of trigonometric problems, whether from the textbook or other sources. Stick to a certain trigonometric concept and dedicate a specific amount of time to practice problems related to that. This way you not only become more familiar with the formulas and the concept but also grow confident in solving new problems.

List down formulas: List down all the formulas you want to memorize, all the functions in a chart and stick it to the wall. Even science says that visual memory is stronger as compared to others and connecting a concept to a chart of formulas makes it easier to memorize. Many educators suggest this method as it has proven to work for them in the past.

Easy hand trick to memorize trigonometric ratios

It is a very easy way to remember trigonometric ratios. Take your left hand and assign the angles. Your thumb denotes 0° , your index finger denotes 30° , middle finger 45° , ring finger 60° and the little finger 90° . Hold your desired angle (finger) down and count the remaining fingers, divide that number by 4 and take the square root of this ratio to get the value of the desired trigonometric function.

Note: count towards left for sine (Sin), count towards right for cosine (Cos)

Ex. For $\sin \theta$ at 0° follow these steps

1. Start counting from the left of the thumb
 2. Since there is no other finger on the left of the thumb, take the number value as 0.
 3. Now divide 0 by 4 i.e. $\frac{0}{4} = \sqrt{\square}$
 4. The square root of $\sqrt{\square}$ is 0. Thus the ratio of $\sin \theta$ at 0° is 0
 5. Similarly follow the trick for other angles. This trick helps you skip memorizing the table as it comes right on your finger tips
- ❖ Find $\operatorname{Cosec} \theta$ by taking the reciprocal of $\sin \theta$
 - ❖ Find $\operatorname{Sec} \theta$ by taking the reciprocal of $\cos \theta$
 - ❖ $\tan \theta$ can be found by taking the ratio of $\sin \theta$ and $\cos \theta$
 - ❖ Find $\operatorname{Cot} \theta$ by taking the reciprocal of $\tan \theta$