Trigonometric Equations

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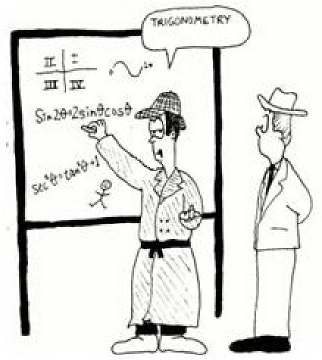
What is a Trigonometric Equation?



The equations having trigonometric functions of unknown angles are known as trigonometric equations.

For example: tan ? = $\frac{1}{\sqrt{3}}$

Solution of a trigonometric equation

The value of the unknown angle that satisfies the given trigonometric equation is called the solution of the trigonometric equation.

General Solutions of Trigonometric Equations

Under this section, we will learn about thegeneral solutions of the trigonometric equations Sin ? = 0, Cos ? = 0, Tan ? = 0 and Cot ? = 0, Sin ? = Sin ?, Cos ? = Cos ? and Tan ? = Tan ? and a Cos ? + b Sin ? = c

General Solution of Sin ? = 0

The general solution of Sin ? = 0 is ? = n ?, n ? Z

General Solution of Cos ? = 0

The general solution of Cos ? = 0 is ? = (2n + 1) $\frac{\Pi}{2}$, n ? Z.

General Solution of Tan ? = 0

The general solution of Tan ? = 0 is ? = n ?, n ? N.

General Solution of Cot ? = 0

The general solution of Cot ? = 0 is (2n + 1)$\frac{\Pi}{2}$, n ? Z.

Important Note:
As we have discussed the general solution of 4 trigonometric ratios out of 6.

General Solution of Sec ? = 0

Since Sec ? ? 1, or Sec ? ? -1

Therefore, Sec ? = 0 does not have any solution.

General Solution of Cosec ? = 0

Since Cosec ? ? 1, or Cosec ? ? -1
Therefore, Cosec ? = 0 does not have any solution.

General Solution of Sin ? = Sin ?

? = n ? + $(-1)^n$ n ?, n ? Z

The equation Cosec ? = Cosec ? is equivalent to Sin ? = Sin ?. Thus, Cosec ? = Cosec ? and Sin ? = Sin ? have the same general solution.

General Solution of Cos ? = Cos ?

? = 2 n ? ± ?, where n ? Z.
The equation Sec ? = Sec ? is equivalent to Cos ? = Cos ?. Thus, Sec ? = Sec ? and Cos ? = Cos ? have the same general solution.

General Solution of Tan ? = Tan ?

? = n ? + ?, n ? Z

The equation Tan ? = Tan ? is equivalent to Cot ? = Cot ?. Thus, Tan ? = Tan ? and Cot ? = Cot ? have the same general solution.

General Solution of Sin^2 ? = Sin^2 ?

? = n ? ± ?, n ? Z.

General Solution of Cos^2 ? = Cos^2 ?

? = n ? ± ?, n ? Z.

General Solution of Tan^2 ? = Tan^2 ?

? = n ? ± ?, n ? Z.

General Solution of a Cos ? + b Sin ? = c

a Cos ? + b Sin ? = c, where a, b, c ? R such that ?c? ? ?a^2 + b^2

In order to solve this type of equations, we reduce them in the form Cos ? = Cos ? or Sin ? = Sin ?.

Now try it yourself! Should you still need any help, click here to schedule live online session with e Tutor!

Reference Links:

- http://www.purplemath.com/modules/solvtrig.htm
- http://www.wikihow.com/Solve-Trigonometric-Equations
- http://en.wikibooks.org/wiki/Trigonometry/Solving_Trigonometric_Equations

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