

Tips and Tricks

1. Know when to Apply Addition Formula (AF)

Observe the angles in the trigonometric functions. Are there summations of 2 different terms in the same Trigonometric term? If the answer is yes, apply the addition formula (AF).

Example Q6) Prove that $\frac{\sin(A+B)-\sin(A-B)}{\cos(A+B)-\cos(A-B)} = -\cot A$

Approach: It is very obvious from all the (A+B) and (A-B) that AF has to be applied.

$$\begin{aligned} LHS &= \frac{\sin(A+B)-\sin(A-B)}{\cos(A+B)-\cos(A-B)} \\ &= \frac{\sin A \cos B + \cos A \sin B - (\sin A \cos B - \cos A \sin B)}{\cos A \cos B - \sin A \sin B - (\cos A \cos B + \sin A \sin B)} \quad \text{(Apply AF)} \\ &= \frac{2 \cos A \sin B}{-2 \sin A \sin B} \\ &= -\cot A = RHS \text{ (Proven)} \end{aligned}$$

2. Good Old Expand/ Factorize/ Simplify/ Cancelling

Many students hold on to the false belief that every single trigonometry proving question require the use of trigonometric identities from the formula sheet. Whenever they get stuck, they resort to staring blindly at the formula sheet and praying that the answer will magically "jump out" at them. More often than not, the miracle does not happen. This is because most proving questions revolve majorly around good old expansion, factorization, simplification and cancelling of like terms.

3. Practice! Practice! Practice!

Proving trigonometric function becomes a piece of cake after you have conquered a massive number questions and expose yourself to all the different varieties of questions. There are no hard and fast rule to handling JEE-level trigonometry proving questions since every question is like a puzzle. But once you have solved a puzzle before, it becomes easier to solve the same puzzle again.