

## Class 10 - Introduction to Trigonometry

### 25 Advance level questions

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Q1. If  $\sin A = 3/5$ , prove that:  
 $(1 + \tan^2 A) / (1 + \cot^2 A) = \tan^2 A$

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Q2. Prove that:  
 $(1 - \sin A)/\cos A + (1 + \sin A)/\cos A = 2 \sec A$

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Q3. If  $\sec A + \tan A = p$ , prove that:  
 $\sec A = (p^2 + 1)/(2p)$ , and  $\tan A = (p^2 - 1)/(2p)$

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Q4. Simplify:  
 $[\sin A (1 + \cot A)] / [\cos A (1 + \tan A)]$

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Q5. Prove that:  
 $(1 - \tan A)/(1 + \tan A) = (\cos A - \sin A)/(\cos A + \sin A)$

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Q6. If  $\cot \theta = 5/12$ , evaluate:  
 $2 \cot \theta / (\operatorname{cosec}^2 \theta - \cot^2 \theta)$

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Q7. Prove that:  
 $(1 - \cos^2 A)/\tan^2 A = \cos^2 A$

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Q8. If  $\cos A = 5/13$ , find the value of:

$$(1 - \sin A)/(1 + \sin A)$$

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Q9. Prove that:

$$(\tan A + \sec A - 1) / (\tan A - \sec A + 1) = (1 + \sin A)/\cos A$$

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Q10. If  $\sin A + \cos A = \sqrt{2} \times \sin A$ , find the value of  $\tan A$

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Q11. Prove that:

$$(1 + \sin A)/\cos A + (1 - \sin A)/\cos A = 2 \sec A$$

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Q12. Evaluate:

$$(\sin^4 30^\circ + \cos^4 60^\circ) / (\sin^2 30^\circ + \cos^2 60^\circ)$$

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Q13. If  $\tan \theta = 3/4$ , prove that:

$$(1 - \sin \theta)/\cos \theta = 1/2$$

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Q14. Simplify:

$$(\cos A + \sin A)/(\cos A - \sin A) + (\cos A - \sin A)/(\cos A + \sin A)$$

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Q15. If  $\sec \theta = 17/8$ , find the values of:

$$(i) \tan \theta \quad (ii) \sin \theta \quad (iii) \operatorname{cosec} \theta$$

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Q16. Prove that:

$$(1 - \cot^2 A)/(1 + \cot^2 A) = (1 - \cos 2A)/(1 + \cos 2A)$$

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Q17. If  $\sin A = 5/13$ , evaluate:

$$\sin A \times \sec A + \cos A \times \operatorname{cosec} A$$

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Q18. If  $\tan A + \cot A = 2$ , prove that:

$$\tan^3 A + \cot^3 A = 2$$

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Q19. Simplify and evaluate:

$$(1 + \tan^2 45^\circ)/(\operatorname{cosec}^2 30^\circ - 1)$$

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Q20. If  $\tan A = 3/4$ , prove that:

$$\sec A - \cos A = 7/20$$