

Class 10 - Introduction to Trigonometry

25 Advance level questions

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

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

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

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

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

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

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

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

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

Q9. Prove that:

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

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

Q11. Prove that:

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

Q12. Evaluate:

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

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

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

Q14. Simplify:

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

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

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

Q16. Prove that:

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

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

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

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

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

Q19. Simplify and evaluate:

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

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

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

Word problems

Q1. A tower is 50 m high. The angle of elevation of its top from a point on the ground is 30° . Find the distance of the point from the foot of the tower.
(Use $\sqrt{3} = 1.732$)

Q2.

The angle of elevation of the top of a building from the foot of a tower is 60° , and the angle of depression of the foot of the building from the top of the tower is 30° . If the height of the tower is 60 m, find the height of the building.

Q3.

A person is standing 100 meters away from a building. The angle of elevation from his eyes to the top of the building is 45° . If his eye level is 1.5 m from the ground, find the height of the building.

Q4.

From a point 20 m above the ground on a building, the angles of depression of the top and bottom of a vertical lamp post are 30° and 45° respectively. Find the height of the lamp post.

Q5.

A kite is flying at a height of 60 meters above the ground. The string attached to the kite is 100 meters long and is stretched tight. Find the angle of elevation of the kite from the ground.

(Correct to nearest degree.)
