

MATHEMATICS

CLASS 10

CHAPTER: INTRODUCTION TO TRIGONOMETRY & APPLICATIONS

Practice Multiple Choice Questions (50 Questions with Answer Key)

Q1. If $\sin \theta = 3/5$, then the value of $\cos \theta$ is:

- (a) $4/5$
- (b) $3/4$
- (c) $5/4$
- (d) $5/3$

Q2. If $\tan \theta = 4/3$, then $\sin \theta + \cos \theta = ?$

- (a) $7/5$
- (b) $1/5$
- (c) $5/7$
- (d) $5/12$

Q3. If $\cos A = 1/2$, then the value of $2 \sec A / (1 + \tan^2 A)$ is:

- (a) 1
- (b) 2
- (c) $1/2$
- (d) 0

Q4. In a right ΔABC right angled at B, if $\tan A = 1$, then $2 \sin A \cos A$ equals:

- (a) 0
- (b) 1
- (c) $1/2$
- (d) 2

Q5. If $\sin \theta = a/b$, then $\cos \theta$ is equal to:

- (a) $b / \sqrt{b^2 - a^2}$
- (b) $\sqrt{b^2 - a^2} / b$
- (c) $a / \sqrt{b^2 - a^2}$
- (d) b/a

Q6. If $15 \cot A = 8$, then $\sec A$ is equal to:

- (a) $17/8$
- (b) $8/17$
- (c) $15/17$
- (d) $17/15$

Q7. If ΔABC is right-angled at C, then the value of $\cos (A + B)$ is:

- (a) 0
- (b) 1
- (c) $1/2$
- (d) $\sqrt{3}/2$

Q8. If $\sin A + \sin^2 A = 1$, then the value of $(\cos^2 A + \cos^4 A)$ is:

- (a) 1
- (b) 0
- (c) 2
- (d) $1/2$

Q9. If $\sec \theta + \tan \theta = x$, then $\sec \theta - \tan \theta$ is:

- (a) x^2 (b) $1/x$
(c) $-x$ (d) $x + 1$

Q10. The value of $(1 + \tan^2 \theta)(1 - \sin \theta)(1 + \sin \theta)$ is:

- (a) 0 (b) 1
(c) 2 (d) $1/2$

Q11. The value of $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$ is:

- (a) 0 (b) 1
(c) 2 (d) $1/2$

Q12. The value of $(2 \tan 30^\circ) / (1 + \tan^2 30^\circ)$ is equal to:

- (a) $\sin 60^\circ$ (b) $\cos 60^\circ$
(c) $\tan 60^\circ$ (d) $\sin 30^\circ$

Q13. The value of $(1 - \tan^2 45^\circ) / (1 + \tan^2 45^\circ)$ is:

- (a) $\tan 90^\circ$ (b) 1
(c) $\sin 45^\circ$ (d) 0

Q14. If $\sin 2A = 2 \sin A$ is true when $A = ?$

- (a) 0° (b) 30°
(c) 45° (d) 60°

Q15. The value of $(2 \tan 30^\circ) / (1 - \tan^2 30^\circ)$ is equal to:

- (a) $\cos 60^\circ$ (b) $\sin 60^\circ$
(c) $\tan 60^\circ$ (d) $\sin 30^\circ$

Q16. If $\tan (A + B) = \sqrt{3}$ and $\tan (A - B) = 1/\sqrt{3}$ ($0^\circ < A + B \leq 90^\circ$; $A > B$), then A is:

- (a) 45° (b) 60°
(c) 30° (d) 15°

Q17. If $\sin \theta = \cos \theta$ for $0^\circ \leq \theta \leq 90^\circ$, then θ is:

- (a) 0° (b) 30°
(c) 45° (d) 60°

Q18. The maximum value of $1/\operatorname{cosec} \theta$ is:

- (a) 0 (b) 1
(c) $1/2$ (d) Infinite

Q19. The value of $(\sin 30^\circ + \cos 60^\circ - \tan 45^\circ)$ is:

- (a) 1 (b) 0
(c) $1/2$ (d) -1

Q20. If $\cos(\alpha + \beta) = 0$, then $\sin(\alpha - \beta)$ can be reduced to:

- (a) $\cos \beta$ (b) $\cos 2\beta$
(c) $\sin \alpha$ (d) $\sin 2\alpha$

Q21. The value of $(5 \cos^2 60^\circ + 4 \sec^2 30^\circ - \tan^2 45^\circ) / (\sin^2 30^\circ + \cos^2 30^\circ)$ is:

- (a) $67/12$ (b) $13/12$
(c) $67/10$ (d) $15/12$

Q22. If $\tan \theta = 1$, then value of $(\sec \theta + \operatorname{cosec} \theta)$ is:

- (a) 2 (b) $2\sqrt{2}$
(c) $\sqrt{2}$ (d) $1/\sqrt{2}$

Q23. If $\sin A = 1/2$, then the value of $(3 \cos A - 4 \cos^3 A)$ is:

- (a) 0 (b) 1
(c) $1/2$ (d) $1/\sqrt{2}$

Q24. If $\theta = 45^\circ$, then $\sec^2 \theta - \tan^2 \theta$ is equal to:

- (a) 0 (b) 1
(c) 2 (d) $\sqrt{2}$

Q25. If $2 \sin 2\theta = \sqrt{3}$, then θ is:

- (a) 30° (b) 45°
(c) 60° (d) 90°

Q26. The value of $(1 + \tan \theta + \sec \theta)(1 + \cot \theta - \operatorname{cosec} \theta)$ is:

- (a) 0 (b) 1
(c) 2 (d) -1

Q27. $(\sec A + \tan A)(1 - \sin A) = ?$

- (a) $\sec A$ (b) $\sin A$
(c) $\operatorname{cosec} A$ (d) $\cos A$

Q28. $(1 + \tan^2 A) / (1 + \cot^2 A) = ?$

- (a) $\sec^2 A$ (b) -1
(c) $\cot^2 A$ (d) $\tan^2 A$

Q29. If $\sin \theta + \cos \theta = \sqrt{2} \cos \theta$, then $\cos \theta - \sin \theta$ is equal to:

- (a) $\sqrt{2} \sin \theta$ (b) $\sqrt{2} \cos \theta$
(c) $1/\sqrt{2} \sin \theta$ (d) 0

Q30. If $4 \tan \theta = 3$, then $(4 \sin \theta - \cos \theta) / (4 \sin \theta + \cos \theta)$ is:

- (a) $2/3$ (b) $1/2$
(c) $1/3$ (d) $3/4$

Q31. If $x = a \cos \theta$ and $y = b \sin \theta$, then $b^2 x^2 + a^2 y^2 = ?$

- (a) $a^2 b^2$ (b) ab
(c) $a^2 + b^2$ (d) $a^2 - b^2$

Q32. If $\cos \theta + \cos^2 \theta = 1$, then $\sin^2 \theta + \sin^4 \theta = ?$

- (a) 0 (b) 1
(c) -1 (d) 2

Q33. The value of $(\operatorname{cosec}^2 \theta - 1) \tan^2 \theta$ is:

- (a) 0 (b) 1
(c) -1 (d) 2

Q34. If $\sin A - \cos A = 0$, then the value of $\sin^4 A + \cos^4 A$ is:

- (a) 1 (b) $3/4$
(c) $1/2$ (d) $1/4$

Q35. If $a \cot \theta + b \operatorname{cosec} \theta = p$ and $b \cot \theta + a \operatorname{cosec} \theta = q$, then $p^2 - q^2 = ?$

- (a) $a^2 - b^2$ (b) $b^2 - a^2$
(c) $a^2 + b^2$ (d) 1

Q36. The value of $(\sin \theta / (1 + \cos \theta)) + ((1 + \cos \theta) / \sin \theta)$ is:

- (a) $2 \sin \theta$ (b) $2 \cos \theta$
(c) $2 \operatorname{cosec} \theta$ (d) $2 \sec \theta$

Q37. If $\sec \theta - \tan \theta = k$, then the value of $\sec \theta + \tan \theta$ is:

- (a) k (b) $1/k$
(c) $1 - k$ (d) k^2

Q38. If $\tan A = n \tan B$ and $\sin A = m \sin B$, then $\cos^2 A = ?$

- (a) $(m^2 - 1)/(n^2 - 1)$ (b) $(m^2 + 1)/(n^2 + 1)$
(c) $(n^2 - 1)/(m^2 - 1)$ (d) $(m^2 - 1)/(n^2 + 1)$

Q39. Value of $(\sin^3 \theta + \cos^3 \theta) / (\sin \theta + \cos \theta) + \sin \theta \cos \theta$ is:

- (a) 0 (b) 1
(c) 2 (d) -1

Q40. If $\sin \theta + \sin^2 \theta + \sin^3 \theta = 1$, then $\cos^6 \theta - 4 \cos^4 \theta + 8 \cos^2 \theta = ?$

- (a) 1 (b) 2
(c) 3 (d) 4

Q41. A pole 6 m high casts a shadow $2\sqrt{3}$ m long on the ground, then the sun's elevation is:

- (a) 60° (b) 45°
(c) 30° (d) 90°

Q42. If the height of a tower and the length of its shadow are equal, then the angle of elevation of the sun is:

- (a) 30° (b) 45°
(c) 60° (d) 90°

Q43. A ladder 15 m long just reaches the top of a vertical wall. If the ladder makes an angle of 60° with the wall, then the height of the wall is:

- (a) $15\sqrt{3}/2$ m (b) $15/2$ m
(c) 15 m (d) 30 m

Q44. The ratio of the length of a rod and its shadow is $1 : \sqrt{3}$. The angle of elevation of the sun is:

- (a) 30° (b) 45°
(c) 60° (d) 90°

Q45. If a kite is flying at a height of 40 m above the ground and the length of the string attached to the kite is 80 m, then the angle of elevation of the kite is:

- (a) 30° (b) 45°
(c) 60° (d) 90°

Q46. A 1.5 m tall boy is standing at some distance from a 30 m tall building. The angle of elevation from his eyes to the top of the building increases from 30° to 60° as he walks towards the building. Distance walked is:

- (a) $19\sqrt{3}$ m (b) $28.5\sqrt{3}$ m
(c) $57\sqrt{3}$ m (d) 19 m

Q47. The angle of depression of an object on the ground from the top of a 75 m high tower is 30° . The distance of the object from the foot of the tower is:

- (a) 75 m
- (b) $75\sqrt{3}$ m
- (c) $25\sqrt{3}$ m
- (d) 150 m

Q48. From a point on the ground, 20 m away from the foot of a vertical tower, the angle of elevation of the top is 60° . The height of the tower is:

- (a) 20 m
- (b) $20\sqrt{3}$ m
- (c) $20/\sqrt{3}$ m
- (d) 40 m

Q49. If two towers of height h_1 and h_2 subtend angles of 60° and 30° respectively at the mid-point of the line joining their feet, then $h_1 : h_2$ is:

- (a) 1 : 2
- (b) 1 : 3
- (c) 3 : 1
- (d) 2 : 1

Q50. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground making an angle of 30° with it. The distance between foot to top touching ground is 8 m. Height of tree is:

- (a) $8\sqrt{3}$ m
- (b) $16\sqrt{3}/3$ m
- (c) $8\sqrt{3}/3$ m
- (d) 24 m

ANSWER KEY & SOLUTIONS GUIDE

Q.No - Ans	Q.No - Ans	Q.No - Ans	Q.No - Ans	Q.No - Ans
Q1: (a) $4/5$	Q11: (b) 1	Q21: (a) $67/12$	Q31: (a) a^2b^2	Q41: (a) 60°
Q2: (a) $7/5$	Q12: (a) $\sin 60^\circ$	Q22: (b) $2\sqrt{2}$	Q32: (b) 1	Q42: (b) 45°
Q3: (a) 1	Q13: (d) 0	Q23: (a) 0	Q33: (b) 1	Q43: (b) $15/2$ m
Q4: (b) 1	Q14: (a) 0°	Q24: (b) 1	Q34: (c) $1/2$	Q44: (a) 30°
Q5: (b) $\sqrt{(b^2 - a^2)} / b$	Q15: (c) $\tan 60^\circ$	Q25: (a) 30°	Q35: (b) $b^2 - a^2$	Q45: (a) 30°
Q6: (a) $17/8$	Q16: (a) 45°	Q26: (c) 2	Q36: (c) $2 \operatorname{cosec} \theta$	Q46: (a) $19\sqrt{3}$ m
Q7: (a) 0	Q17: (c) 45°	Q27: (d) $\cos A$	Q37: (b) $1/k$	Q47: (b) $75\sqrt{3}$ m
Q8: (a) 1	Q18: (b) 1	Q28: (d) $\tan^2 A$	Q38: (a) $(m^2 - 1)/(n^2 - 1)$	Q48: (b) $20\sqrt{3}$ m
Q9: (b) $1/x$	Q19: (b) 0	Q29: (a) $\sqrt{2} \sin \theta$	Q39: (b) 1	Q49: (c) 3 : 1
Q10: (b) 1	Q20: (b) $\cos 2\beta$	Q30: (b) $1/2$	Q40: (d) 4	Q50: (a) $8\sqrt{3}$ m