



# CBSE NCERT Based Chapter wise Questions (2025-2026)

Class-X

Subject: Mathematics

Total : 8 Marks (expected) [MCQ(2+1)-1 Mark, SA-I(1)-2 Marks, SA-II(1)-3 Marks]

Chapter Name : *Introduction to Trigonometry* (Chap : 8)

**Level - 1**

## MCQ Type :

1. If  $x = r \sin \theta$  and  $y = r \cos \theta$  then, the value of  $x^2 + y^2$  is:

- (A)  $r$  (B)  $r^2$  (C)  $\frac{1}{r}$  (D)  $1$

[Hints : square and add.]

2. If  $3 \sec \theta - 5 = 0$  then,  $\cot \theta$  is equal to:

- (A)  $\frac{5}{3}$  (B)  $\frac{4}{5}$  (C)  $\frac{3}{4}$  (D)  $\frac{3}{5}$

[Hints : Find  $\sec \theta$ ]

3. If  $\theta = 45^\circ$  then,  $\sec \theta \cot \theta - \operatorname{cosec} \theta \tan \theta$  is:

- (A)  $0$  (B)  $1$  (C)  $2\sqrt{2}$  (D)  $\sqrt{2}$

[Hints : Use standard angle values]

4.  $\frac{\sin \theta}{\sqrt{1 - \sin^2 \theta}}$  can also be written as:

- (A)  $\cot \theta$  (B)  $\sqrt{\sin \theta}$  (C)  $\frac{\sin \theta}{\sqrt{\cos \theta}}$  (D)  $\tan \theta$

[Hints : Use  $1 - \sin^2 \theta = \cos^2 \theta$ ]

5.  $\cot \theta + \tan \theta$  equals:

- (A)  $\operatorname{cosec} \theta \sec \theta$  (B)  $\sin \theta \sec \theta$  (C)  $\cos \theta \tan \theta$  (D)  $\sin^2 \theta$

[Hints : Write  $\cot \theta$  and  $\tan \theta$  in terms  $\sin \theta$  and  $\cos \theta$ ]

6. If  $\sin(A - B) = \frac{1}{2}$  and  $\cos(A + B) = \frac{1}{2}$  then, A and B will be, respectively:

- (A)  $15^\circ, 45^\circ$  (B)  $45^\circ, 15^\circ$  (C)  $45^\circ, 45^\circ$  (D)  $30^\circ, 60^\circ$

[Hints :  $A - B = 30^\circ, A + B = 60^\circ$ ]

7. If  $\sin \theta + \sin^2 \theta = 1$ , then the value of  $\cos^2 \theta + \cos^4 \theta$  will be:

- (A)  $1$  (B)  $2 \sin^2 \theta$  (C)  $1 + 2 \sin^2 \theta$  (D) can't be determined

[Hints : Use  $\sin^2 \theta + \cos^2 \theta = 1$ ]

8. The value of  $\theta$ , for  $\sin 2\theta = 1, 0^\circ < \theta < 90^\circ$  is:

- (A)  $60^\circ$  (B)  $55^\circ$  (C)  $45^\circ$  (D)  $135^\circ$

[Hints :  $\sin 90^\circ = 1$ ]

9. If  $\cos \theta = \frac{1}{2}, \sin \beta = \frac{1}{2}$  then value of  $\theta + \beta$ :

- (A)  $30^\circ$  (B)  $60^\circ$  (C)  $90^\circ$  (D)  $120^\circ$

[Hints : Use standard angle]

10.  $\frac{(1 + \tan^2 A)}{(1 + \cot^2 A)} = \text{_____} ?$

(A)  $\sec^2 A$

(B)  $-1$

(C)  $\cot^2 A$

(D)  $\tan^2 A$

[Hints :  $\cot A = \frac{1}{\tan A}$ ]

### ASSERTION-REASON BASED QUESTIONS (Q.11- Q.14):

**DIRECTIONS:** In each of the questions given below, there are two statements marked as Assertion (A) and Reason (R). Mark your answer as per the codes provided below:

- a. Both A and R are true and R is the correct explanation of A.
- b. Both A and R are true but R is not the correct explanation of A.
- c. A is true but R is false.
- d. A is false but R is true.

11. **Assertion (A):** If  $x = 2 \sin^2 \theta$  and  $y = 2 \cos^2 \theta + 1$  then the value of  $x + y = 3$ .

**Reason (R):** For any value of  $\theta$ ,  $\sin^2 \theta + \cos^2 \theta = 1$ .

(A) a

(B) b

(C) c

(D) d

12. **Assertion (A):**  $\sin A$  is the product of  $\sin$  and  $A$ .

**Reason (R):** The value of  $\sin \theta$  increases as  $\theta$  increases when  $0^\circ \leq \theta \leq 90^\circ$ .

(A) a

(B) b

(C) c

(D) d

13. **Assertion (A):**  $(\cos^4 A - \sin^4 A)$  is equal to  $2 \cos^2 A - 1$ .

**Reason (R):** The value of  $\cos \theta$  decreases as  $\theta$  increases when  $0^\circ \leq \theta \leq 90^\circ$ .

(A) a

(B) b

(C) c

(D) d

14. **Assertion (A):** In a right  $\triangle ABC$ , right-angled at B, if  $\tan A = 1$ , then  $2 \sin A \cdot \cos A = 1$ .

**Reason (R):** cosec A is the abbreviation used for cosecant of angle A.

(A) x

(B) 3

(C) x

(D) 2

### SA-I TYPE:

15. If  $\sin(A + B) = \frac{\sqrt{3}}{2}$  and  $(A - B) = \frac{1}{2}$ ,  $0 \leq A + B \leq 90^\circ$  and  $A > B$ , then find A and B.

[Hints :  $A + B = 60^\circ$ ,  $A - B = 30^\circ$ ]

16. Evaluate  $3 \cos^2 60^\circ \sec^2 30^\circ - 2 \sin^2 30^\circ \tan^2 60^\circ$ .

[Hints : Use standard angle values]

17. Simplify:  $\frac{\tan^2 \theta}{1 + \tan^2 \theta} + \frac{\cot^2 \theta}{1 + \cot^2 \theta}$

[Hints :  $\cot \theta = \frac{1}{\tan \theta}$ ]

18. If  $7 \sin^2 A + 3 \cos^2 A = 4$ , then find  $\tan A$  where A is acute angle.

[Hints : Use  $\sin^2 A + \cos^2 A = 1$ ]

19. If  $\cos A = \frac{2}{5}$ , find the value of  $4 + 4 \tan^2 A$ .

[Hints : Find  $\tan A$ ]

20. Write the value of  $\frac{5}{\cot^2 \theta} - \frac{5}{\cos^2 \theta}$ .

[Hints : Use  $\sec^2 \theta - \tan^2 \theta = 1$ ]

**SA-II TYPE:**

21. If  $\operatorname{cosec} \theta + \cot \theta = p$ , then prove that  $\cos \theta = \frac{p^2 - 1}{p^2 + 1}$ .

[Hints : Find  $\operatorname{cosec} \theta - \cot \theta$ . Also find  $\operatorname{cosec} \theta$  and  $\cot \theta$ ]

22. Prove that  $\frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} = \sec \theta + \tan \theta$ .

[Hints : Dividing numerator and denominator by  $\cos \theta$ .

23. If  $\sin \theta + \cos \theta = \sqrt{3}$ , then prove that  $\tan \theta + \cot \theta = 1$ .

[Hints : Squaring both sides, find  $\sin \theta \cos \theta$ ]

24. Prove that:  $\frac{\cos^2 \theta}{1 - \tan \theta} + \frac{\sin^2 \theta}{1 - \cot \theta} = 1 + \sin \theta \cos \theta$ .

[Hints : Write  $\cot \theta$  and  $\tan \theta$  in terms  $\sin \theta$  and  $\cos \theta$ ]

25. If  $\cos \theta + \sin \theta = \sqrt{2} \cos \theta$ , show that  $\cos \theta - \sin \theta = \sqrt{2} \sin \theta$ .

[Hints : Square both sides]

**ANSWER**

1. (B)
2. (C)
3. (A)
4. (D)
5. (A)
6. (B)
7. (A)
8. (C)
9. (C)
10. (D)
11. (A)
12. (D)
13. (B)
14. (B)
15.  $45^\circ, 15^\circ$
16.  $-\frac{1}{2}$
17. 1
18.  $\frac{1}{\sqrt{3}}$
19. 25
20. -5