

GRADE X

Question Bank (MATHEMATICS)

Chapter-8 TRIGONOMETRY

1 marks:

1. If $2 \tan A = 3$, then the value of $\frac{4 \sin A + 3 \cos A}{4 \sin A - 3 \cos A}$ is **[BOARD 2023]**
a) $\frac{7}{\sqrt{13}}$ b) $\frac{1}{\sqrt{13}}$ c) 3 d) doesn't exist
2. If $\tan \theta = \frac{5}{12}$ then the value of $\frac{\sin \theta + \cos \theta}{\sin \theta - \cos \theta}$ is **[BOARD 2023]**
a) $\frac{-17}{7}$ b) $\frac{17}{7}$ c) $\frac{17}{13}$ d) $\frac{-7}{13}$
3. If $\tan \theta = \frac{x}{y}$ then $\cos \theta$ is **[BOARD 2023]**
a) $\frac{x}{\sqrt{x^2 + y^2}}$ b) $\frac{x}{\sqrt{x^2 - y^2}}$ c) $\frac{y}{\sqrt{x^2 + y^2}}$ d) $\frac{y}{\sqrt{x^2 - y^2}}$
4. If $\sin A = \frac{2}{3}$ then value of $\cot A$ is **[BOARD 2024]**
a) $\frac{\sqrt{5}}{2}$ b) $\frac{3}{2}$ c) $\frac{5}{4}$ d) $\frac{2}{3}$
5. If $\sin \theta = \cos \theta$, ($0^\circ < \theta < 90^\circ$) then the value of $\sec \theta \sin \theta$ is **[BOARD 2024]**
a) $\frac{1}{\sqrt{2}}$ b) $\sqrt{2}$ c) 1 d) 0
6. If $\sec \theta - \tan \theta = \frac{1}{3}$, then the value of $(\sec \theta + \tan \theta)$ is **[BOARD 2023]**
a) $\frac{4}{3}$ b) $\frac{2}{3}$ c) $\frac{1}{3}$ d) 3
7. If $\sec \theta - \tan \theta = m$, then the value of $(\sec \theta + \tan \theta)$ is **[BOARD 2024]**
a) $1 - \frac{1}{m}$ b) $m^2 - 1$ c) $\frac{1}{m}$ d) $-m$
8. If $\cos(\alpha + \beta) = 0$ then the value of $\cos\left(\frac{\alpha + \beta}{2}\right)$ is **[BOARD 2024]**
a) $\frac{1}{\sqrt{2}}$ b) $\frac{1}{2}$ c) 0 d) $\sqrt{2}$
9. If $\triangle ABC$ is a right triangle at C, then the value of $\cos(A + B)$ is
a) 0 b) 1 c) $\frac{1}{2}$ d) $\frac{\sqrt{3}}{2}$
10. If $\cos \theta = \frac{\sqrt{3}}{2}$ and $\sin \varphi = \frac{1}{2}$ then $\tan(\theta + \varphi)$ is **[BOARD 2024]**
a) $\sqrt{3}$ b) $\frac{1}{\sqrt{3}}$ c) 1 d) not defined
11. If $\sin \theta + \cos \theta = \sqrt{2}$ then $\tan \theta + \cot \theta =$
a) 1 b) 2 c) 3 d) 4

12. $\left[\frac{3}{4}\tan^2 30^\circ - \sec^2 45^\circ + \sin^2 60^\circ\right]$ is equal to **[BOARD 2023]**
 a) -1 b) $\frac{5}{6}$ c) $\frac{-3}{2}$ d) $\frac{1}{6}$
13. $\left[\frac{5}{8}\sec^2 60^\circ - \tan^2 60^\circ + \cos^2 45^\circ\right]$ is equal to **[BOARD 2023]**
 a) 0 b) $\frac{-5}{3}$ c) $\frac{-1}{2}$ d) $\frac{-1}{4}$
14. $\left(\frac{2\tan 30^\circ}{1+\tan^2 30^\circ}\right)$ is equal to **[BOARD 2023]**
 a) $\sin 60^\circ$ b) $\cos 60^\circ$ c) $\tan 60^\circ$ d) $\sin 30^\circ$
15. $\left(\frac{1-\tan^2 30^\circ}{1+\tan^2 30^\circ}\right)$ is equal to **[BOARD 2023]**
 a) $\sin 60^\circ$ b) $\cos 60^\circ$ c) $\tan 60^\circ$ d) $\cos 30^\circ$
16. If $x \tan 60^\circ \cos 60^\circ = \sin 60^\circ \cot 60^\circ$, then x is
 a) $\cos 30^\circ$ b) $\tan 30^\circ$ c) $\sin 30^\circ$ d) $\cot 30^\circ$
17. Simplified form of $\frac{\cos^2 \theta}{\sin^2 \theta} - \frac{1}{\sin^2 \theta}$ is **[BOARD 2023]**
 a) $\tan^2 \theta$ b) $\sec^2 \theta$ c) 1 d) -1
18. Simplified form of $(\cos^4 A - \sin^4 A)$ is **[BOARD 2023]**
 a) $2 \sin^2 A - 1$ b) $2 \sin^2 A + 1$ c) $2 \cos^2 A + 1$ d) $2 \cos^2 A - 1$
19. $\sec \theta$ when expressed in terms of $\cot \theta$ is equal to **[BOARD 2023]**
 a) $\frac{1+\cot^2 \theta}{\cot \theta}$ b) $\frac{\sqrt{1+\cot^2 \theta}}{\cot \theta}$ c) $\sqrt{1+\cot^2 \theta}$ d) $\frac{\sqrt{1-\cot^2 \theta}}{\cot \theta}$
20. Which of the following is true for all values of θ ($0^\circ \leq \theta \leq 90^\circ$)? **[BOARD 2023]**
 a) $\cos^2 \theta - \sin^2 \theta = 1$ c) $\operatorname{cosec}^2 \theta - \sec^2 \theta = 1$
 b) $\sec^2 \theta - \tan^2 \theta = 1$ d) $\cot^2 \theta - \tan^2 \theta = 1$
21. If θ is an acute angle of a right angled triangle, then which of the following equation is not true? **[BOARD 2023]**
 a) $\sin \theta \cot \theta = \cos \theta$ c) $\cos \theta \tan \theta = \sin \theta$
 b) $\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$ d) $\tan^2 \theta - \sec^2 \theta = 1$
22. If $x = p \sec \theta$ and $y = q \tan \theta$ then
 a) $x^2 - y^2 = p^2 q^2$ c) $x^2 q^2 - y^2 p^2 = pq$
 b) $x^2 q^2 - y^2 p^2 = \frac{1}{p^2 q^2}$ d) $x^2 q^2 - y^2 p^2 = p^2 q^2$
23. $(\sec^2 \theta - 1)(\operatorname{cosec}^2 \theta - 1)$ is equal to **[BOARD 2023]**
 a) -1 b) 1 c) 0 d) 2

24. $2 \cos^2 \theta (1 + \tan^2 \theta)$ is equal to

[COMPARTMENT 2023]

- a) 0 b) 1 c) 2 d) 3

25. If $\frac{x}{3} = 2 \sin A$, $\frac{y}{3} = 2 \cos A$ then the value of $x^2 + y^2$ is

[BOARD 2024]

- a) 36 b) 9 c) 6 d) 18

26. If $x \sin^3 \theta + y \cos^3 \theta = \sin \theta \cos \theta$ and $x \sin \theta = y \cos \theta$ then $x^2 + y^2$ is

- a) 0 b) $\frac{1}{2}$ c) 1 d) $\frac{3}{2}$

27. If $x = a \cos \theta$ and $y = b \sin \theta$ then the value of $b^2 x^2 + a^2 y^2$ is

[BOARD 2024]

- a) $a^2 b^2$ b) ab c) $a^4 b^4$ d) $a^2 + b^2$

Options for Assertion and Reasoning Questions:

- a) Both assertion(A) and reason(R) are true and reason(R) is the correct explanation of assertion(A)
- b) Both assertion(A) and reason(R) are true but reason(R) is not the correct explanation of assertion(A)
- c) Assertion (A) is true but reason (R) is false
- d) Assertion (A) is false but reason (R) is true

28. **Assertion (A):** For $0 < \theta \leq 90^\circ$, $\operatorname{cosec} \theta - \cot \theta$ and $\operatorname{cosec} \theta + \cot \theta$ are reciprocal of each other.

Reason (R): $\operatorname{cosec}^2 \theta - \cot^2 \theta = 1$.

[BOARD 2023]

29. **Assertion (A):** If $\sin A = \frac{1}{3}$ ($0^\circ < A < 90^\circ$) then the value of $\cos A$ is $\frac{2\sqrt{2}}{3}$.

Reason (R): For every angle θ , $\sin^2 \theta + \cos^2 \theta = 1$.

[BOARD 2024]