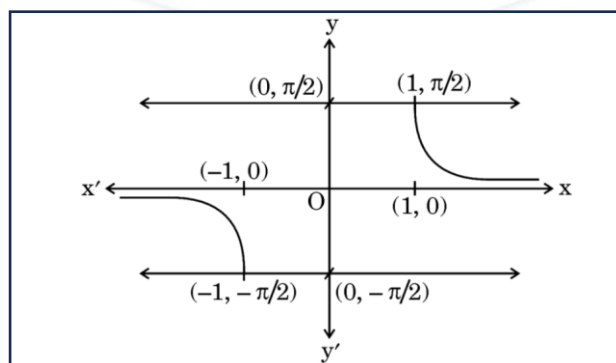


CLASS 12 – CBSE | MATHEMATICS Inverse Trigonometric Functions

SECTION -A (Multiple choice questions)

- Domain of $\sin^{-1}(2x - 1)$
(a) $[0, 1]$ (b) $[-1, 1]$ (c) $(-1, 1)$ (d) $[0, \pi]$
- If $\sin^{-1} x + \sin^{-1} y + \sin^{-1} z = \frac{3\pi}{2}$, then the value of $x^{100} + y^{100} + z^{100} - \frac{9}{x^{101} + y^{101} + z^{101}}$ is
(a) 1 (b) 0 (c) 2 (d) 3
- The value of the expression $\sin [\cot^{-1} (\cos (\tan^{-1} 1))]$ is
(a) 0 (b) 1 (c) $\frac{1}{\sqrt{3}}$ (d) $\sqrt{\frac{2}{3}}$
- Let $\theta = \sin^{-1} (\sin (-600^\circ))$, then value of θ is
(a) $\frac{\pi}{3}$ (b) $\frac{\pi}{2}$ (c) $\frac{2\pi}{3}$ (d) $-\frac{2\pi}{3}$
- The domain of $\sin^{-1}(-x^2)$ is
(a) $[0, 1]$ (b) $[-1, 1]$ (c) $[-\frac{1}{2}, \frac{1}{2}]$ (d) N.O.T.
- If $\cos^{-1} \alpha + \cos^{-1} \beta + \cos^{-1} \gamma = 3\pi$, then $\alpha(\beta + \gamma) + \beta(\gamma + \alpha) + \gamma(\alpha + \beta)$ equals
(a) 0 (b) 1 (c) 6 (d) 12
- The following graph represents:
(a) $y = \cos^{-1} x$ (b) $y = \sec^{-1} x$ (c) $y = \tan^{-1} x$ (d) $y = \operatorname{cosec}^{-1} x$



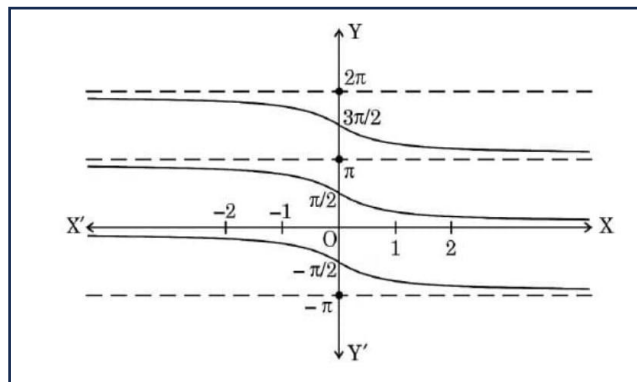
- The following graph represents:

(a) $y = \cot^{-1} x$

(b) $y = \sec^{-1} x$

(c) $y = \tan^{-1} x$

(d) $y = \operatorname{cosec}^{-1} x$



9. If $y = \cos^{-1}(\cos 10)$, then y is equal to

(a) 10

(b) $4\pi - 10$

(c) $2\pi + 10$

(d) $2\pi - 10$

10. Which one of the following is correct?

(a) $\tan 1 > \tan^{-1} 1$

(b) $\tan 1 < \tan^{-1} 1$

(c) $\tan 1 = \tan^{-1} 1$

(d) N.O.T.

11. Domain of $\cos^{-1}\left(\frac{1}{x-3}\right)$

(a) $[-1, 1]$

(b) $[2, 4]$

(c) $[-\infty, 2] \cup [4, \infty]$

(d) $[-\infty, -1] \cup [1, \infty]$

12. $\sin\left[\frac{\pi}{3} - \sin^{-1}\left(-\frac{1}{2}\right)\right]$ is equal to:

(a) $\frac{1}{2}$

(b) $\frac{1}{3}$

(c) -1

(d) 1

13. If $2\tan^{-1} x = y$, then:

(a) $-\frac{1}{2} < y < \frac{1}{2}$

(b) $-\frac{\pi}{2} < y < \frac{\pi}{2}$

(c) $-\pi < y < \pi$

(d) N.O.T

14. The value of $\tan^2(\sec^{-1}2) + \cot^2(\operatorname{cosec}^{-1}3)$ is

(a) 5

(b) 11

(c) 13

(d) 15

SECTION -B

(Short Answer Type Questions)

15. Find the domain of $\sec^{-1}(2x + 1)$.

16. Find the domain of $\sin^{-1}\sqrt{2x - 3}$.

17. Find the domain of $y = \cos^{-1}(x^2 - 4)$

18. Find the principal value of the expression

i) $\cos^{-1}[\cos(-680^\circ)]$

ii) $\sin^{-1}\left(\cos \frac{43\pi}{5}\right)$

iii) $\sin^{-1}\left(\cos \frac{33\pi}{5}\right)$

19. Draw the graph of $\sec^{-1} x$.

20. Evaluate: $\tan\left(\sin^{-1}1 - \cos^{-1}\left(-\frac{1}{2}\right)\right)$.



21. Prove that : $\tan^{-1}\left(\frac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1+x^2} - \sqrt{1-x^2}}\right) = \frac{\pi}{4} + \frac{1}{2} \cos^{-1} x^2$

22. Find the value of $\sin [\cot^{-1} \sqrt{2} (\cos (\tan^{-1} 1))]$.

23. Evaluate $\tan^{-1}\left[\cos^{-1}\left(\tan \frac{3\pi}{4}\right)\right]$.

24. Evaluate: $\cos^{-1}\left(\cos \frac{13\pi}{6}\right) + \tan^{-1}\left(\tan \frac{5\pi}{6}\right) + \sin^{-1}\left(\sin \frac{2\pi}{3}\right)$

25. Simplify : $\tan^{-1}\left(\frac{\cos 2x - \sin 2x}{\cos 2x + \sin 2x}\right)$, $0 < x < \frac{\pi}{4}$.



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CLASS 12 – CBSE | MATHEMATICS

Inverse Trigonometric Functions- Answer Key

SECTION -A (Multiple choice questions)

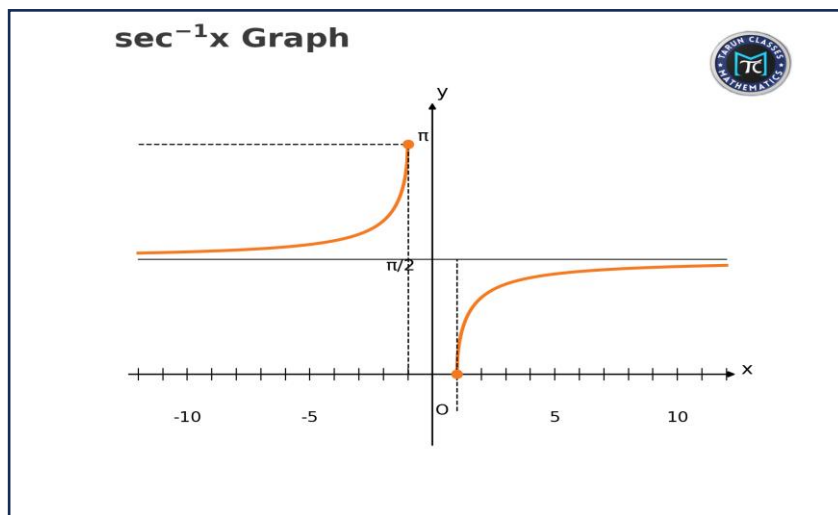
1. (a)
2. (b)
3. (d)
4. (a)
5. (b)
6. (c)
7. (d)
8. (a)
9. (b)
10. (a)
11. (c)
12. (d)
13. (c)
14. (b)

SECTION -B

(Short Answer Type Questions)

15. $(-\infty, -1] \cup [0, \infty)$
16. $\left[\frac{3}{2}, 2\right]$
17. $[-\sqrt{5}, -\sqrt{3}] \cup [\sqrt{3}, \sqrt{5}]$
18. (i) $\frac{2\pi}{9}$ (ii) $-\frac{\pi}{10}$ (iii) $-\frac{\pi}{10}$

19.



20. $-\frac{1}{\sqrt{3}}$

22. $\frac{1}{\sqrt{2}}$

23. $\tan^{-1}(\pi)$

24. $\frac{\pi}{3}$

25. $\frac{\pi}{4} - 2x$

