MATHS

BOOKS - A N EXCEL PUBLICATION

INVERSE TRIGONOMETRIC FUNCTIONS

Question Type

1. Write the principal value of $\sin^{-1}\left(\frac{1}{2}\right)$

Watch Video Solution

2. Find the principal value of

$\cos^{-1}\left(\frac{1}{\sqrt{2}}\right)$

Watch Video Solution

3. Find the principal value of

$$\cot^{-1}\left(\frac{-1}{\sqrt{3}}\right)$$

Watch Video Solution

4. Find the principal value of

$$\sin^{-1}\left(\frac{-\sqrt{3}}{2}\right)$$

Watch Video Solution

5. Write the principal value of $\sin^{-1}\left(\frac{1}{2}\right)$

Watch Video Solution

6. Find the principal value of $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$

Watch Video Solution

7. Find the principle value of the following

$\cos ec^{-1}(2)$

Watch Video Solution

8. Find the principle value of the following

$\tan^{-1}(-\sqrt{3})$

Watch Video Solution

9. Find the principal value of $\cos^{-1}\left(-\frac{1}{2}\right)$

Watch Video Solution

10. Find the principle value of the following

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

Watch Video Solution

11. Find the principle value of the following

$\sec^{-1}\left(\frac{2}{\sqrt{3}}\right)$

Watch Video Solution

12. Find the principle value of the following

$\tan^{-1}(-\sqrt{3})$

Watch Video Solution

13. Find the principle value of the following

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

Watch Video Solution

14. Find the principle value of the following

$\cos ec^{-1}(2)$

Watch Video Solution

15. Find the value of $\cos^{-1}\left(\frac{1}{2}\right) + 2\sin^{-1}\left(\frac{1}{2}\right)$

Watch Video Solution

16. If $\sin^{-1} x = y$, then find the range of y

A. $0 \leq y \leq \pi$

B. $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$

C. $0 < y < \pi$

D. $-\frac{\pi}{2} < y < \frac{\pi}{2}$

Answer: B

Watch Video Solution

17. Find $\tan^{-1}\sqrt{3} - \sec^{-1}(-2)$

A. π

B. $-\frac{\pi}{3}$

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

D. $\frac{2\pi}{3}$

Answer: B

Watch Video Solution

18. Find the value of the following

$$\cos^{-1}\left(\cos\frac{13\pi}{6}\right)$$

Watch Video Solution

19. Find the values of the following :

$$\tan^{-1}\left(\tan\frac{3\pi}{4}\right)$$

Watch Video Solution

20. Prove that $2\sin^{-1}\left(\frac{3}{5}\right) = \tan^{-1}\left(\frac{24}{7}\right)$

Watch Video Solution

21. prove the following

$$\sin^{-1}\frac{8}{17} + \sin^{-1}\frac{3}{5} = \sin^{-1}\frac{77}{85}$$

Watch Video Solution

22. Show that $\cos^{-1}\left(\frac{4}{5}\right)+\cos^{-1}\left(\frac{12}{13}\right)=\tan^{-1}\left(\frac{56}{33}\right)$

Watch Video Solution

23. Prove the following :

$\cos^{-1}\left(\frac{12}{13}\right)+\sin^{-1}\left(\frac{3}{5}\right)=\sin^{-1}\left(\frac{56}{65}\right)$

Watch Video Solution

24. prove the following

$\tan^{-1}\frac{63}{16}=\sin^{-1}\frac{5}{13}+\cos^{-1}\frac{3}{5}$

Watch Video Solution

25. Show that

$$\tan^{-1}\frac{1}{5}+\tan^{-1}\frac{1}{7}+\tan^{-1}\frac{1}{3}+\tan^{-1}\frac{1}{8}=\frac{\pi}{4}$$

Watch Video Solution

26. Prove the following :

$$\tan^{-1}\sqrt{x}=\frac{1}{2}\cos^{-1}\left(\frac{1-x}{1+x}\right), x\in[0,1]$$

Watch Video Solution

27. Prove the following :

$$\cot^{-1}\left(\frac{\sqrt{1+\sin x}+\sqrt{1-\sin x}}{\sqrt{1+\sin x}-\sqrt{1-\sin x}}\right)=\frac{x}{2}, x\in\left(0,\frac{\pi}{4}\right)$$

Watch Video Solution

28. Solve the following :

$$\tan^{-1}\left(\frac{1-x}{1+x}\right) = \frac{1}{2}\tan^{-1}x(x>0)$$

Watch Video Solution

29. Prove the following :

$$\frac{9\pi}{8} - \frac{9}{4}\sin^{-1}\left(\frac{1}{3}\right) = \frac{9}{4}\sin^{-1}\left(\frac{2\sqrt{2}}{3}\right)$$

Watch Video Solution

30. Solve the following

$$2\tan^{-1}(\cos x) = \tan^{-1}(2\cos ecx)$$

Watch Video Solution

31. Solve the following :

$$\tan^{-1}\left(\frac{1-x}{1+x}\right) = \frac{1}{2}\tan^{-1}x(x > 0)$$

Watch Video Solution

32. $\sin\left(\tan^{-1}x\right), |x| < 1$is equal to

A. $\frac{x}{\sqrt{1-x^2}}$

B. $\frac{1}{\sqrt{1-x^2}}$

C. $\frac{x}{\sqrt{1+x^2}}$

D. $\frac{1}{\sqrt{1+x^2}}$

Answer: D

Watch Video Solution

33. $\sin^{-1}(1-x) - 2\sin^{-1}x = \frac{\pi}{2}$,then find x

A. 0,1/2

B. 1,1/2

C. 0

D. 44198

Answer: C

Watch Video Solution

34. $\tan^{-1}\left(\frac{x}{y}\right) - \tan^{-1}\left(\frac{x-y}{x+y}\right) =$

A. $\frac{\pi}{2}$

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

C. $\frac{\pi}{4}$

D. $\frac{-3\pi}{4}$

Answer: C

Watch Video Solution

Question Bank

1. prove that

$$\tan^{-1}\sqrt{x} = \frac{1}{2}\cos^{-1}\left(\frac{1-x}{1+x}\right), x \in [0, 1]$$

Watch Video Solution

2. Prove that $3\sin^{-1}x = \sin^{-1}(3x - 4x^3), x \in \left[-\frac{1}{2}, \frac{1}{2}\right]$

Watch Video Solution

3. prove that

$$3\cos^{-1}x = \cos^{-1}(4x^3 - 3x), x \in \left[\frac{1}{2}, 1\right]$$

Watch Video Solution

4. Prove that $\tan^{-1}\left(\frac{2}{11}\right)+\tan^{-1}\left(\frac{7}{24}\right)=\tan^{-1}\left(\frac{1}{2}\right)$

Watch Video Solution

5. Prove that $2\tan^{-1}\left(\frac{1}{2}\right)+\tan^{-1}\left(\frac{1}{7}\right)=\tan^{-1}\left(\frac{31}{17}\right)$

Watch Video Solution

6. Write the following functions in the simplest form :

$\tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right), x\neq 0$

Watch Video Solution

7. Write the following functions in the simplest form :

$\tan^{-1}\left(\frac{1}{\sqrt{x^2-1}}\right), |x|>1$

Watch Video Solution

8. Write the following functions in the simplest form :

$\tan^{-1}\sqrt{\frac{1-\cos x}{1+\cos x}}, 0 < x < \pi$

Watch Video Solution

9. Write the following functions in the simplest form :

$\tan^{-1}\left(\frac{\cos x - \sin x}{\cos x + \sin x}\right), -\frac{\pi}{4} < x < \frac{3\pi}{4}$

Watch Video Solution

10. Write the following functions in the simplest form :

$\tan^{-1}\left(\frac{x}{\sqrt{a^2 - x^2}}\right), |x| < a$

Watch Video Solution

11. Write the following functions in the simplest form :

$$\tan^{-1}\left(\frac{3a^2x - x^3}{a^3 - 3ax^2}\right), a > 0, -\frac{a}{\sqrt{3}} \leq x \leq \frac{a}{\sqrt{3}}$$

Watch Video Solution

12. Find the value of

$$\tan^{-1}\left[2\cos\left(2\sin^{-1}\frac{1}{2}\right)\right]$$

Watch Video Solution

13. Find the value of

$$\cot\left(\tan^{-1}a + \cot^{-1}a\right)$$

Watch Video Solution

14. Find the values of the following

$$\tan\frac{1}{2}\left[\sin^{-1}\left(\frac{2x}{1+x^2}\right)+\cos^{-1}\left(\frac{1-y^2}{1+y^2}\right)\right], |x|<1, y>0 \text{ and } xy<1$$

Watch Video Solution

15. If $\sin\left(\sin^{-1}\left(\frac{1}{5}\right)+\cos^{-1}(x)\right)=1$

Watch Video Solution

16. If $\tan^{-1}\left(\frac{x-1}{x-2}\right)+\tan^{-1}\left(\frac{x+1}{x+2}\right)=\frac{\pi}{4}$. then find the value of x.

Watch Video Solution

17. Find the value of

$$\sin^{-1}\sin\left(\frac{2\pi}{3}\right)$$

Watch Video Solution

18. Find the values of the following :

$\tan^{-1}\left(\tan\frac{3\pi}{4}\right)$

Watch Video Solution

19. Evaluate $\tan\left(\sin^{-1}\frac{3}{5}+\cot^{-1}\frac{3}{2}\right)$

Watch Video Solution

20. find the value of $\cos^{-1}\cos\left(\frac{7\pi}{3}\right)$

A. $\frac{7\pi}{6}$

B. $\frac{5\pi}{6}$

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

D. $\frac{\pi}{6}$

Answer: B

Watch Video Solution

21. Find $\sin\left(\frac{\pi}{3} - \sin^{-1}\left(-\frac{1}{2}\right)\right)$ =

A. $\frac{1}{2}$

B. $\frac{1}{3}$

C. $\frac{1}{4}$

D. 1

Answer: D

Watch Video Solution

22. Find tan^(-1) sqrt3 -sec^(-1)(-2)

A. π

B. $-\frac{\pi}{2}$

C. 0

D. $2\sqrt{3}$

Answer: B

Watch Video Solution