MATHS

BOOKS - JMD MATHS (PUNJABI ENGLISH)

INVERSE TRIGONOMETRIC FUNCTIONS

Example

1. Range of function $\cos^{-1} x$ is :

   A. $[-1, 1]$

B. $[0, \pi]$

C. $\left[-\frac{\pi}{2}, \frac{\pi}{2} \right]$

D. $(-1, 1)$

Answer: B

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2. Write the value of $\sin^{-1} x + \cos^{-1} x$ from the following :

A. 1

B. π

C. 0

D. $\dfrac{\pi}{2}$

Answer: D

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3. Select the correct answer :

$\sin\left(\cos^{-1} x + \tan^{-1} x\right) =$

A. 1

B. π

C. 0

D. $\dfrac{\pi}{2}$

Answer: A

4. Select the correct answer :Principal value of

$\tan^{-}\sqrt{3} =$

A. $\dfrac{\pi}{6}$

B. $\dfrac{\pi}{4}$

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

D. $\dfrac{\pi}{2}$

Answer: C

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5. Principal value of $\sin^{-1}\left(-\dfrac{3}{2}\right)$ is :

A. $\pi/3$

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

C. $\dfrac{\pi}{6}$

D. $-\dfrac{\pi}{6}$

Answer: B

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6. Principal value of $\cos^{-1}\left(-\dfrac{1}{2}\right)$ is :

A. $-2\dfrac{\pi}{3}$

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

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

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

Answer: D

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7. Select the correct answer :

$$\cos^{-1}\left(\dfrac{1}{2}\right) + 2\sin^{-1}\left(\dfrac{1}{2}\right)$$

A. $2\dfrac{\pi}{3}$

B. $3\dfrac{\pi}{4}$

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

D. $\dfrac{\pi}{3}$

Answer: A

8. $\tan^{-1}\left(\dfrac{1}{\sqrt{3}}\right)$ - $\sin^{-1}\left(\dfrac{1}{2}\right)$ is equal to :

A. $\dfrac{\pi}{4}$

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

C. $-\dfrac{\pi}{4}$

D. $-\dfrac{\pi}{3}$

Answer: C

9. Select the correct answer :$\sin^{-1}\left(\sin 2\dfrac{\pi}{3}\right)$

A. $-2\dfrac{\pi}{3}$

B. $2\dfrac{\pi}{3}$

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

D. $-\dfrac{\pi}{3}$

Answer: C

10. Select the correct answer : $\sin\left(\cos^{-1} x\right) =$

A. $\sqrt{\left(1 - x^2\right)}$

B. x

C. $\sqrt{\left(1 + x^2\right)}$

D. $\sqrt{\left(x^2 - 1\right)}$

Answer:

11. Range of function $\tan^{-1} x$ is :

12. Domain of the function $f(x) = \sin^{-1} x$ is equal to :

13. Principal value of $\cos^{-1}\left(-\dfrac{1}{2}\right)$ is :

14. Find the value of $\tan\left(\sin^{-1}\dfrac{3}{5} + \cot^{-1}\dfrac{3}{2}\right)$.

15. Principal value of $\cos^{-1}\left(-\dfrac{1}{2}\right)$ is :

16. Find $\dfrac{dy}{dx}$ when: $y = \tan^{-1}\left(\dfrac{2x}{1-x^2}\right)$

17. Prove that

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

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18. Prove that $\sqrt{\dfrac{1+\sin A}{1-\sin A}} = \dfrac{1+\sin A}{\cos A}$.

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19. Show that :

$$\tan^{-1}\frac{1}{3} + \tan^{-1}\frac{1}{5} = \frac{1}{2}\cos^{-1}\frac{33}{65}$$

20. Prove that : `tan^(-1) (1) + tan ^-1 (2) + tan^(-1)

(3) = pi1

21. Solve the $2 \tan^{-1}(\cos x) = \tan^{-1}(2 \cos ecx)$.

22. Show that:

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

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23. Prove that :

$$2\tan^{-1}\frac{1}{5} + \tan^{-1}\frac{1}{8} = \tan^{-1}\frac{4}{7}$$

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24. Prove that :

$$\tan^{-1}\left[\frac{\sqrt{1+x}-\sqrt{1-x}}{\sqrt{1+x}+\sqrt{1-x}}\right] = \frac{\pi}{4} - \frac{1}{2}\cos^{-1} x$$

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25. Find the value

$$2\tan^{-1}\left(\frac{1}{5}\right) + \sec^{-1}\left(\frac{5\sqrt{2}}{7}\right) + 2\tan^{-1}\left(\frac{1}{8}\right)$$

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26. Prove that :

$$\sin^{-1}\left(\frac{3}{5}\right) + \cos^{-1}\left(\frac{5}{\sqrt{26}}\right) = \tan^{-1}\left(\frac{19}{17}\right).$$

27. Solve for x:

$$\tan^{-1}(x+1) + \tan^{-1}(x-1) = \tan^{-1}\frac{8}{31}, x > 0$$

28. Prove that :

$$\cos^{-1}\frac{12}{13} + \sin^{-1}\frac{4}{5} = \tan^{-1}\frac{63}{16}$$

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29. Prove that

$$\cos\left(\tan^{-1}\left(\sin\left(\cot^{-1}x\right)\right)\right) = \sqrt{\frac{x^2+1}{x^2+2}}$$

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

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