

4. trigonometry 1 mark

Date : 05-Jul-19

12th Standard 2019 EM

Maths

Reg.No. :

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Time : 00:50:00 Hrs

Total Marks : 50

FOR ANSWERS JOIN WHATSAPP GROUP - 8056206308 [FEES RS.500 PER YEAR UNLIMITED PAPERS]

45 x 1 = 45

- 1) The value of $\sin^{-1}(\cos x)$, 0 is
(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{3}$
- 2) If $\sin^{-1}x + \sin^{-1}y = \frac{\pi}{2}$ then $\cos^{-1}x + \cos^{-1}y$ is equal to
(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{3}$
- 3) $\sin^{-1}\left(\frac{1}{2}\right) + \cos^{-1}\left(\frac{1}{2}\right)$ is equal to
(a) 2 (b) 1 (c) 0 (d) $\tan^{-1}\frac{1}{\sqrt{3}}$
- 4) If $\sin^{-1}x = 2\sin^{-1}y$ has a solution, then
(a) $x \leq y$ (b) $x \geq y$ (c) $x \leq y$ or $x \geq y$ (d) $x \in \mathbb{R}$
- 5) $\sin^{-1}(\cos x) \Delta \frac{\pi}{2}$ is valid for
(a) $x \in [0, \pi]$; (b) $x \in [\frac{\pi}{2}, \frac{3\pi}{2}]$; (c) $x \in [0, \frac{\pi}{2}]$; (d) $x \in [\frac{\pi}{2}, \pi]$
- 6) If $\sin^{-1}x + \sin^{-1}y + \sin^{-1}z = \frac{\pi}{2}$, the value of $x^{2017} + y^{2018} + z^{2019}$ is
(a) 0 (b) 1 (c) 2 (d) 3
- 7) If $\cot^{-1}x = \frac{\pi}{4}$ for some $x \in \mathbb{R}$, the value of $\tan^{-1}x$ is
(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{6}$
- 8) The domain of the function defined by $f(x) = \sin^{-1}x$ is
(a) [1,2] (b) [-1,1] (c) [0,1] (d) [-1,0]
- 9) If $x = \frac{\pi}{4}$, the value of $\cos(\cos^{-1}x + 2\sin^{-1}x)$ is
(a) $\frac{\sqrt{2}}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$
- 10) $\sin^{-1}\left(\frac{1}{2}\right) + \cos^{-1}\left(\frac{1}{2}\right)$ is equal to
(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{3}$
- 11) If the function $f(x) = \sin^{-1}(x^2 - 3)$, then x belongs to
(a) [-1,1] (b) $[-\sqrt{3}, \sqrt{3}]$ (c) $[-\sqrt{6}, \sqrt{6}]$ (d) $[-\sqrt{6}, \sqrt{6}]$
- 12) If $\cot^{-1}2$ and $\cot^{-1}3$ are two angles of a triangle, then the third angle is
(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{2}$
- 13) $\sin^{-1}\left(\frac{1}{2}\right) + \cos^{-1}\left(\frac{1}{2}\right) = \frac{\pi}{2}$. Then x is a root of the equation
(a) $x^2 - x - 6 = 0$ (b) $x^2 - x - 12 = 0$ (c) $x^2 + x - 12 = 0$ (d) $x^2 + x - 6 = 0$
- 14) $\sin^{-1}(2\cos^2x - 1) + \cos^{-1}(1 - 2\sin^2x) =$
(a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{3}$
- 15) If $\sin^{-1}\left(\frac{1}{2}\right) + \cos^{-1}\left(\frac{1}{2}\right) = \frac{\pi}{2}$, then $\cos 2u$ is equal to
(a) $\tan^2$ (b) 0 (c) -1 (d) $\tan 2$
- 16) If $|x| \leq 1$, then $2\tan^{-1}x - \sin^{-1}\frac{x}{\sqrt{1-x^2}}$ is equal to
(a) $\tan^{-1}x$ (b) $\sin^{-1}x$ (c) 0 (d) $\frac{\pi}{2}$
- 17)

The equation $\tan^{-1}x - \cot^{-1}x = \tan^{-1}$ has

- (a) no solution (b) unique solution (c) two solutions (d) infinite number of solutions

18) If $\sin^{-1}x + \cot^{-1}2 = 3\Delta$, then x is equal to

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{5}$

19) If $\sin^{-1} \frac{1}{5} + \Delta = \frac{\pi}{2}$, then the value of x is

- (a) 4 (b) 5 (c) 2 (d) 3

20) $\sin(\tan^{-1}x)$, $|x| < 1$ is equal to

- (a) $\frac{x}{\sqrt{1+x^2}}$ (b) $\frac{x}{\sqrt{1-x^2}}$ (c) $\frac{x}{\sqrt{1+x^2}}$ (d) $\frac{x}{\sqrt{1-x^2}}$

21) If $\sin^{-1}x < \frac{\pi}{2}$ and $\cos^{-1}x < \frac{\pi}{2}$, then $x^2 =$

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d)

22) If $\sin^{-1}x < \frac{\pi}{2}$ and $\cos^{-1}x < \frac{\pi}{2}$, then

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) none of these

23) The number of solutions of the equation $\sin^{-1}x + \cos^{-1}x = \frac{\pi}{2}$ is

- (a) 2 (b) 3 (c) 1 (d) none

24) If $\sin^{-1}x < \frac{\pi}{2}$ and $\cos^{-1}x < \frac{\pi}{2}$, then

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) none

25) The number of real solutions of the equation $\sin^{-1}x + \cos^{-1}x = \frac{\pi}{2}$ is

- (a) 0 (b) 1 (c) 2 (d) infinite

26) If $\sin^{-1}x < \frac{\pi}{2}$ and $\cos^{-1}x < \frac{\pi}{2}$, then

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{5}$

27) $\sin^{-1}x < \frac{\pi}{2}$ and $\cos^{-1}x < \frac{\pi}{2}$, then

- (a) 0 (b) $\frac{1}{2}$ (c) -1 (d) none

28) If $\tan^{-1}(3) + \tan^{-1}(x) = \tan^{-1}(8)$ then x =

- (a) 5 (b) $\frac{1}{2}$ (c) $\frac{1}{3}$ (d) $\frac{1}{4}$

29) The value of $\sin^{-1}x + \cos^{-1}x$ is

- (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{3}$ (c) $\frac{\pi}{4}$ (d) 0

30) $\sin^{-1}x + \cos^{-1}x = \frac{\pi}{2}$

- (a) $\frac{a}{\Delta}$ (b) $\frac{\Delta}{5}$ (c) $\frac{1}{\Delta}$ (d) $\frac{\Delta}{5}$
- 31) If $\left[\frac{a}{\Delta} < 5 \right]$ then x is
- (a) $\frac{a}{\Delta} > 5$ (b) $\frac{a}{\Delta} < 5$ (c) $\frac{a}{\Delta} = 5$ (d) $\frac{a}{\Delta} > 5$
- 32) If $\left(\frac{a}{\Delta} < 5 \right) \implies \left\{ \frac{a}{\Delta} < 5 \right\}$ then x is
- (a) 0 (b) -2 (c) 1 (d) 2
- 33) If $\frac{a}{\Delta} \in \mathbb{R}$ then
- (a) $\frac{a}{\Delta} \pm \frac{a}{\Delta} < 5$ (b) $\frac{a}{\Delta} \pm \frac{a}{\Delta} < 5$ (c) $\frac{a}{\Delta} \pm \frac{a}{\Delta} < 5$ (d) $x > 0$
- 34) In a $\triangle ABC$ if C is a right angle, then $\left(\frac{a}{\Delta} < 5 \right) \implies \left\{ \frac{a}{\Delta} < 5 \right\}$
- (a) $\frac{a}{\Delta} > 5$ (b) $\frac{a}{\Delta} < 5$ (c) $\frac{a}{\Delta} = 5$ (d) $\frac{a}{\Delta}$
- 35) $\left(\frac{a}{\Delta} < 5 \right) \implies \left\{ \frac{a}{\Delta} < 5 \right\}$
- (a) 7 (b) 6 (c) 5 (d) none
- 36) If $\frac{a}{\Delta} < 5$ then $\frac{a}{\Delta} = 6$
- (a) $\frac{a}{\Delta} > 5$ (b) $\frac{a}{\Delta} < 5$ (c) $\frac{a}{\Delta} = 5$ (d) none
- 37) The domain of $\cos^{-1}(x^2 - 4)$ is _____
- (a) [3,5] (b) [-1,1] (c) $\sqrt{16} \cup \sqrt{6}$ (d) [0,1]
- 38) The value of $\tan \left(\frac{a}{\Delta} < 5 \right) \implies \left\{ \frac{a}{\Delta} < 5 \right\}$ is _____
- (a) $\frac{a}{\Delta} < 5$ (b) $\frac{a}{\Delta} < 5$ (c) $\frac{a}{\Delta} < 5$ (d) $\frac{a}{\Delta} < 5$
- 39) The value of $\sin(2(\tan^{-1} 0.75))$ is _____
- (a) 0.75 (b) 1.5 (c) 0.96 (d) $\sin^{-1}(1.5)$
- 40) If $x > 1$, then $\frac{a}{\Delta} < 5 \implies \left\{ \frac{a}{\Delta} < 5 \right\}$ is _____
- (a) $4 \tan^{-1} x$ (b) 0 (c) $\frac{a}{\Delta}$ (d) $\frac{a}{\Delta}$
- 41) If $\frac{a}{\Delta} < 5$ then one of the possible values of $\frac{a}{\Delta}$ is _____
- (a) $\frac{a}{\Delta} > 5$ (b) $\frac{a}{\Delta} < 5$ (c) $\frac{a}{\Delta} = 5$ (d) $\frac{a}{\Delta} > 5$
- 42) The value of $\left(\frac{a}{\Delta} < 5 \right) \implies \left\{ \frac{a}{\Delta} < 5 \right\}$ is _____
- (a) $\frac{a}{\Delta} > 5$ (b) $\frac{a}{\Delta} < 5$ (c) $\frac{a}{\Delta} < 5$ (d) $\frac{a}{\Delta}$
- 43) If $x < 0, y < 0$ such that $xy = 1$, then $\tan^{-1}(x) + \tan^{-1}(y) =$ _____
- (a) $\frac{a}{\Delta}$ (b) $\frac{a}{\Delta}$ (c) $\frac{a}{\Delta}$ (d) none
- 44)

The principal value of _____ is _____

(a) $\frac{a}{a}$ (b) $\frac{a}{a}$ (c) $\frac{a}{a}$ (d) $\frac{a}{a}$

45) $\frac{a}{a}$

(a) $\frac{a}{a}$ (b) $\frac{a}{a}$ (c) $\frac{a}{a}$ (d) $\frac{a}{a}$

CHOOSE ODD ONE OUT

5 x 1 = 5

46) (1) Domain is $2 \leq x \leq 6$

(2) Range is $[-6, 6]$

(3) Odd function

(4) Periodic function

47) (1) $\tan(\tan^{-1}x) = x$ if $x \in \mathbb{R}$

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

(3) $\tan^{-1}\left(\frac{1}{x}\right) = -\frac{\pi}{2} - \tan^{-1}x$ if $x < 0$

(4)

$$\tan^{-1}\left(\frac{1}{x}\right) = \begin{cases} \cot^{-1}x, & \text{if } x > 0 \\ -\frac{\pi}{2} + \cot^{-1}x, & \text{if } x < 0 \end{cases}$$

48) (1) The x-intercept is 1 and the y-intercept is $\frac{1}{e}$

(2) It is an even function

(3) Not symmetric with respect to origin

(4) Not symmetric with respect to y-axis

49) (1) $\tan^{-1}x = \frac{\pi}{4}$ if $x = 1$

(2) $\tan^{-1}x = \frac{\pi}{4}$ if $x = 1$

(3) $\tan^{-1}x = \frac{\pi}{4}$ if $x = 1$

(4) $\tan^{-1}x = \frac{\pi}{4}$ if $x = 1$

50) (1) $\cot(\cot^{-1}600) = 600$

(2) $\cot(\cot^{-1}1782) = 1782$

(3) $\cot^{-1}\left(\frac{1}{x}\right) = \frac{\pi}{2} - \cot^{-1}x$

(4) $\cot^{-1}\left(\frac{1}{x}\right) = -\frac{\pi}{2} - \cot^{-1}x$

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Time : 01:00:00 Hrs

Total Marks : 60

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30 x 2 = 60

- 1) Find all the values of x such that

$$-10 \leq x \leq 10 \text{ and } \sin x = 0$$

- 2) Find the period and amplitude of

$$y = \sin 7x$$

- 3) Find the value of

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

- 4) For what value of x does
- $\sin x = \sin^{-1} x$
- ?

- 5) Find the domain of the following

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

- 6) Find the value of
- $\sin^{-1} \left(\frac{1}{2} \right) = \frac{\pi}{6}$

- 7) State the reason for
- $\cos^{-1} \left(\frac{1}{2} \right) = \frac{\pi}{3}$

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

- 9) For what value of x, the inequality
- $\frac{1}{2} \leq x \leq \frac{3}{2}$

- 10) Find the domain of the following functions :

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

- 11) Find the value of

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

- 12) Find the value of

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

- 13) Find the principal value of

$$\sec^{-1} 2 = \frac{\pi}{3}$$

- 14) Find the value of

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

- 15) Find the value, if it exists. If not, give the reason for non-existence.

$$\sin^{-1}(\cos x)$$

- 16) If
- $\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \frac{\pi}{2}$
- , show that
- $x+y+z=xyz$

- 17) Find the number of solution of the equation
- $\tan^{-1}(x-1) + \tan^{-1}x + \tan^{-1}(x+1) = \tan^{-1}(3x)$

- 18) Find all the values of x such that

$$-8 \leq x \leq 8 \text{ and } \sin x = -1$$

- 19) Find the period and amplitude of

$$y = \sin 2x \leq \frac{1}{2}$$

- 20) Find the value of

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

- 21)

Find all values of x such that

$$-5 \leq x \leq \frac{\pi}{2} \text{ and } \cos x = 1$$

22) Find the value of

$$\sqrt{2} \sqrt{2 - \frac{3}{a}}$$

23) Find the value of

$$\tan(\tan^{-1}(-0.2021))$$

24) Find the value of

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

25) Find the principal value of

$$\cot^{-1} 2$$

26) Find the principal value of

$$\operatorname{cosec}^{-1} 2$$

27) Find the value, if it exists. If not, give the reason for non-existence

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

28) Find the value, if it exists. If not, give the reason for non-existence.

$$\sin^{-1}[\sin 5]$$

29) Find the value of the expression in terms of x, with the help of a reference triangle.

$$\cos(\tan^{-1}(3x-1))$$

30) Find the value of the expression in terms of x, with the help of a reference triangle.

$$\tan^{-1}\left(\frac{5}{x}\right)$$

Inverse Trigonometric Functions TEST 1

12th Standard

Maths

Exam Time : 01:30:00 Hrs

Total Marks : 50

25 x 2 = 50

- 1) Find the principal value of $\sin^{-1}(2)$, if it exists.
- 2) Find all the values of x such that
 $-10\pi \leq x \leq 10\pi$ and $\sin x = 0$
- 3) For what value of x does $\sin x = \sin^{-1}x$?
- 4) Find all values of x such that
 $6\pi \leq x \leq 6\pi$ and $\cos x = 0$
- 5) Is $\cos^{-1}(-x) = \pi - \cos^{-1}(x)$ true? Justify your answer.
- 6) Find the value of
 $2\cos^{-1}\left(\frac{1}{2}\right) + \sin^{-1}\left(\frac{1}{2}\right)$
- 7) Find the value of
 $\tan\left(\tan^{-1}\left(\frac{7\pi}{4}\right)\right)$
- 8) If $\cot^{-1}\frac{1}{7} = \theta$, find the value of $\cos\theta$.
- 9) Find the principal value of
 $\sec^{-1}\left(\frac{2}{\sqrt{3}}\right)$
- 10) Prove that $\frac{\pi}{2} \leq \sin^{-1}x + 2\cos^{-1}x \leq \frac{3\pi}{2}$.
- 11) Find the value of
i) $\sin\left[\frac{\pi}{3} - \sin^{-1}\left(-\frac{1}{2}\right)\right]$
- 12) Solve $\tan^{-1}\left(\frac{1-x}{1+x}\right) = \frac{1}{2}\tan^{-1}x$ for $x > 0$
- 13) Find the value, if it exists. If not, give the reason for non-existence.
 $\sin^{-1}(\cos\pi)$
- 14) Prove that $\tan^{-1}x + \tan^{-1}z = \tan^{-1}\left[\frac{x+y+z-xyz}{1-xy-yz-zx}\right]$
- 15) Find all the values of x such that
 $-8\pi \leq x \leq -8\pi$ and $\sin x = -1$
- 16) Find the period and amplitude of
 $y = 4\sin(-2x)$
- 17) Find all values of x such that
 $-5\pi \leq x \leq 5\pi$ and $\cos x = -1$
- 18) Find the value of
 $\cos^{-1}\left(\cos\frac{\pi}{7}\cos\frac{\pi}{17} - \sin\frac{\pi}{7}\sin\frac{\pi}{17}\right)$.
- 19) Find the value of
 $\tan\left(\tan^{-1}(-0.2021)\right)$
- 20) Find the principal value of
 $\cot^{-1}(\sqrt{3})$

21) Simplify

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

22) Simplify

$$\sin^{-1}[\sin 10]$$

23) Find the principal value of $\sin^{-1}(-1)$.

24) Prove that $\tan^{-1} \left(\frac{1}{7} \right) + \tan^{-1} \left(\frac{1}{13} \right) = \tan^{-1} \left(\frac{2}{9} \right)$

25) Prove that $2\tan^{-1} \left(\frac{2}{3} \right) = \tan^{-1} \left(\frac{12}{5} \right)$

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Time : 01:30:00 Hrs

Total Marks : 90

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30 x 3 = 90

- 1) Find the domain of $\sin^{-1}(2-3x^2)$
- 2) Find the principal value of $\tan^{-1}(\sqrt{3})$
- 3) Find the value of $\tan^{-1}(-1) + \cos^{-1}(\frac{1}{2}) + \sin^{-1}(-\frac{1}{2})$

4) Prove that $\tan(\sin^{-1}x) = \frac{x}{\sqrt{1-x^2}}$, $-1 < x < 1$.

5) Prove that $\frac{\pi}{2} \leq \sin^{-1}x + 2\cos^{-1}x \leq \frac{3\pi}{2}$.

6) Find the value of

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

7) Prove that $\tan(\sin^{-1}x) = \frac{x}{\sqrt{1-x^2}}$ for $|x| < 1$

8) Evaluate $\sin\left[\sin^{-1}\left(\frac{3}{5}\right) + \sec^{-1}\left(\frac{5}{4}\right)\right]$

9) Prove that

$$\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{3} = \frac{\pi}{4}$$

10) If $\cos^{-1}x + \cos^{-1}y + \cos^{-1}z = \pi$ and $0 < x, y, z < 1$, show that $x^2 + y^2 + z^2 + 2xyz = 1$

11) If $a_1, a_2, a_3, \dots$ an is an arithmetic progression with common difference d , prove that $\tan$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \left[\tan^{-1}\left(\frac{d}{1+a_1a_2}\right) + \tan^{-1}\left(\frac{d}{1+a_2a_3}\right) + \dots + \tan^{-1}\left(\frac{d}{1+a_na_{n-1}}\right) \right] = \frac{a_n - a_1}{1 + a_1a_n}$$

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

13) Solve $\sin^{-1}x > \cos^{-1}x$

14) Show that $\cot(\sin^{-1}x) = \frac{\sqrt{1-x^2}}{x}$ $-1 \leq x \leq 1$ and $x \neq 0$

15) Solve $\tan^{-1}2x + \tan^{-1}3x = \frac{\pi}{4}$, if $6x^2 < 1$

16) Solve $\tan^{-1}\left(\frac{x-1}{x-2}\right) + \tan^{-1}\left(\frac{x+1}{x+2}\right) = \frac{\pi}{4}$

17) Solve $\cos\left(\sin^{-1}\left(\frac{x}{\sqrt{1+x^2}}\right)\right) = \sin\left\{\cot^{-1}\left(\frac{3}{4}\right)\right\}$

18) Simplify

$$\sec^{-1}\left(\sec\left(\frac{5\pi}{3}\right)\right)$$

19) Find the value of

$$\cos\left[\frac{1}{2}\cos^{-1}\left(\frac{1}{8}\right)\right]$$

20) Find the value of

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

21) Prove that

$$2\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{7} = \tan^{-1}\frac{31}{17}$$

22)

$$\text{Prove that } \cos^{-1}\left(\frac{4}{5}\right) + \tan^{-1}\left(\frac{3}{5}\right) = \tan^{-1}\left(\frac{27}{11}\right)$$

23)

$$\text{Evaluate } \cos\left[\sin^{-1}\frac{3}{5} + \sin^{-1}\frac{5}{13}\right]$$

24)

$$\text{Prove that } \tan^{-1}\left(\frac{m}{n}\right) - \tan^{-1}\left(\frac{m-n}{m+n}\right) = \frac{\pi}{4}$$

25)

$$\text{Solve: } \tan^{-1}\left(\frac{x-1}{x-2}\right) + \tan^{-1}\left(\frac{x+1}{x+2}\right) = \frac{\pi}{4}$$

26)

$$\text{Solve } \tan^{-1}\left(\frac{2x}{1-x^2}\right) + \cot^{-1}\left(\frac{1-x^2}{2x}\right) = \frac{\pi}{3}, x > 0$$

27)

$$\text{If } \sin\left(\sin^{-1}\frac{1}{5} + \cos^{-1}x\right) = 1 \text{ then find the value of } x.$$

28)

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

29) Find the real solutions of the equation

$$\tan^{-1}\sqrt{x(x+1)} + \sin^{-1}\sqrt{x^2+x+1} = \frac{\pi}{2}$$

30)

$$\text{Solve: } \cos(\tan^{-1}x) = \sin\left(\cot^{-1}\frac{3}{4}\right)$$

Inverse Trigonometric Functions TEST 5

12th Standard

Maths

Exam Time : 02:00:00 Hrs

Total Marks : 75

25 x 3 = 75

- 1) Sketch the graph of $y = \sin\left(\frac{1}{3}x\right)$ for $0 \leq x < 6\pi$.
- 2) Find the domain of $\cos^{-1}\left(\frac{2+\sin x}{3}\right)$
- 3) For what value of x , the inequality $\frac{\pi}{2} < \cos^{-1}(3x - 1) < \pi$
- 4) Find the principal value of $\tan^{-1}(\sqrt{3})$
- 5) Find the value of $\tan^{-1}(-1) + \cos^{-1}\left(\frac{1}{2}\right) + \sin^{-1}\left(-\frac{1}{2}\right)$
- 6) Evaluate $\sin\left[\sin^{-1}\left(\frac{3}{5}\right) + \sec^{-1}\left(\frac{5}{4}\right)\right]$
- 7) Solve $\tan^{-1} 2x + \tan^{-1} 3x = \frac{\pi}{4}$, if $6x^2 < 1$
- 8) Find the value of $\sin^{-1}\left(\cos\left(\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)\right)\right)$
- 9) Simplify: $\tan^{-1} \frac{x}{y} - \tan^{-1} \frac{x-y}{x+y}$
- 10) Solve $\sin^{-1} \frac{5}{x} + \sin^{-1} \frac{12}{x} = \frac{\pi}{2}$
- 11) Find the domain of the following $g(x) = 2\sin^{-1}(2x-1) - \frac{\pi}{4}$
- 12) Find the value of $\cos^{-1}\left(\cos\left(\frac{4\pi}{3}\right)\right) + \cos^{-1}\left(\cos\left(\frac{5\pi}{4}\right)\right)$.
- 13) Find the domain of the following functions $\frac{1}{2}\tan^{-1}(1-x^2) - \frac{\pi}{4}$
- 14) Find the value of $\cos\left(\sin^{-1}\left(\frac{4}{5}\right) - \tan^{-1}\left(\frac{3}{4}\right)\right)$
- 15) Find the value of $\cot^{-1}(1) + \sin^{-1}\left(-\frac{\sqrt{3}}{2}\right) - \sec^{-1}(-\sqrt{2})$
- 16) Find the value of the expression in terms of x , with the help of a reference triangle. $\tan\left(\sin^{-1}\left(x + \frac{1}{2}\right)\right)$
- 17) Find the value of $\tan\left(\sin^{-1}\frac{3}{5} + \cot^{-1}\frac{3}{2}\right)$
- 18) Solve: $2\tan^{-1}x = \cos^{-1}\frac{1-a^2}{1+a^2} - \cos^{-1}\frac{1-b^2}{1+b^2}, a > 0, b > 0$
- 19) Solve $\cot^{-1}x - \cot^{-1}(x+2) = \frac{\pi}{12}, x > 0$

20) Prove that

$$2\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{7} = \tan^{-1}\frac{31}{17}$$

21) Evaluate $\cos \left[\sin^{-1}\frac{3}{5} + \sin^{-1}\frac{5}{13} \right]$

22) Prove that $\tan^{-1}\left(\frac{m}{n}\right) - \tan^{-1}\left(\frac{m-n}{m+n}\right) = \frac{\pi}{4}$

23) Solve: $\tan^{-1}\left(\frac{x-1}{x-2}\right) + \tan^{-1}\left(\frac{x+1}{x+2}\right) = \frac{\pi}{4}$

24) If $\sin\left(\sin^{-1}\frac{1}{5} + \cos^{-1}x\right) = 1$ then find the value of x .

25) Solve: $\cos(\tan^{-1}x) = \sin\left(\cot^{-1}\frac{3}{4}\right)$

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Time : 01:00:00 Hrs

FOR ANSWERS JOIN WHATSAPP GROUP - 8056206308 [FEES RS.500 PER YEAR UNLIMITED PAPERS]

1) Find (i) $\cos^{-1} 2 \leq 3$

ii) $\cos^{-1} 2 \geq 33$

iii) $\cos^{-1} 2 \leq \frac{n}{a} 33$

2) Find the domain of $\cos^{-1} 2 \leq 3$

3) Show that $\cot^{-1} \left(\frac{\sqrt{\Delta}}{6} \right) < 6 \in <$

4) Find the domain of the following functions

(i) $f(x) = \sin^{-1}(2x - 3)$

(ii) $f(x) = \sin^{-1}x + \cos x$

5) Write the function $2 \leq 3 \Delta < \frac{5}{5} \pm \pm$ in the simplest form

6) Simplify $\left(\frac{5}{6} \pm \pm \right)$

7) If $\left(\frac{5}{5} = \frac{5}{5} \right) \Delta$ then prove that $x^2 = \sin 2a$

8) Prove that $\left(\frac{5}{5} \right) \left\{ \left(\frac{5}{5} \right) \Delta \right\}$

INVERSE TRIGONOMETRY FULL TEST

Date : 05-Jul-19

12th Standard 2019 EM

Maths

Reg.No. :

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Total Marks : 90

10 x 1 = 10

Time : 02:30:00 Hrs

FOR ANSWERS WHATSAPP [FEES RS.500 PER YEAR]

1) If $\sin^{-1}x + \sin^{-1}y = \frac{2\pi}{3}$; then $\cos^{-1}x + \cos^{-1}y$ is equal to

- (a)
- $\frac{2\pi}{3}$
- (b)
- $\frac{\pi}{3}$
- (c)
- $\frac{\pi}{6}$
- (d)
- π

2) $\sin^{-1}\left(\tan\frac{\pi}{4}\right) - \sin^{-1}\left(\sqrt{\frac{3}{x}}\right) = \frac{\pi}{6}$. Then x is a root of the equation

- (a)
- $x^2 - x - 6 = 0$
- (b)
- $x^2 - x - 12 = 0$
- (c)
- $x^2 + x - 12 = 0$
- (d)
- $x^2 + x - 6 = 0$

3) $\sin^{-1}(2\cos^2x - 1) + \cos^{-1}(1 - 2\sin^2x) =$

- (a)
- $\frac{\pi}{2}$
- (b)
- $\frac{\pi}{3}$
- (c)
- $\frac{\pi}{4}$
- (d)
- $\frac{\pi}{6}$

4) The equation $\tan^{-1}x - \cot^{-1}x = \tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$ has

- (a) no solution (b) unique solution (c) two solutions (d) infinite number of solutions

5) If $\sin^{-1}\frac{x}{5} + \operatorname{cosec}^{-1}\frac{5}{4} = \frac{\pi}{2}$, then the value of x is

- (a) 4 (b) 5 (c) 2 (d) 3

6) If $\sin^{-1}x - \cos^{-1}x = \frac{\pi}{6}$ then

- (a)
- $\frac{1}{2}$
- (b)
- $\frac{\sqrt{3}}{2}$
- (c)
- $-\frac{1}{2}$
- (d) none of these

7) The number of solutions of the equation $\tan^{-1}2x + \tan^{-1}3x = \frac{\pi}{4}$

- (a) 2 (b) 3 (c) 1 (d) none

8) The number of real solutions of the equation $\sqrt{1 + \cos 2x} = 2\sin^{-1}(\sin x)$, $-\pi < x < \pi$ is

- (a) 0 (b) 1 (c) 2 (d) infinite

9) If $\alpha = \tan^{-1}\left(\frac{\sqrt{3}}{2y-x}\right)$, $\beta = \tan^{-1}\left(\frac{2x-y}{\sqrt{3}y}\right)$ then $\alpha - \beta$

- (a)
- $\frac{\pi}{6}$
- (b)
- $\frac{\pi}{3}$
- (c)
- $\frac{\pi}{2}$
- (d)
- $-\frac{\pi}{3}$

10) If $\tan^{-1}(3) + \tan^{-1}(x) = \tan^{-1}(8)$ then x =

- (a) 5 (b)
- $\frac{1}{5}$
- (c)
- $\frac{5}{14}$
- (d)
- $\frac{14}{5}$

10 x 2 = 20

11)

Find the period and amplitude of

$$y = \sin 7x$$

12) Find the value of

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

13)

$$\text{Find the value of } \sin^{-1}\left(\sin\frac{5\pi}{9}\cos\frac{\pi}{9} + \cos\frac{5\pi}{9}\sin\frac{\pi}{9}\right).$$

14) Find the value of

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

15) Find the domain of

$$f(x) = \sin^{-1}\left(\frac{|x|-2}{3}\right) + \cos^{-1}\left(\frac{1-|x|}{4}\right)$$

16) Find the value of

$$\cos\left(\cos^{-1}\left(\frac{4}{5}\right) + \sin^{-1}\left(\frac{4}{5}\right)\right)$$

17) Find the value of

$$\tan\left(\tan^{-1}\left(\frac{7\pi}{4}\right)\right)$$

18) Find the value of

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

19) Find the value, if it exists. If not, give the reason for non-existence.

$$\sin^{-1}(\cos\pi)$$

20) If $\tan^{-1}x + \tan^{-1}y + \tan^{-1}z = \pi$, show that $x+y+z=xyz$

$$10 \times 3 = 30$$

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

22) Prove that $\frac{\pi}{2} \leq \sin^{-1}x + 2\cos^{-1}x \leq \frac{3\pi}{2}$.

23) Simplify

$$\cos^{-1}\left(\cos\left(\frac{13\pi}{3}\right)\right)$$

24) Prove that

$$\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{3} = \frac{\pi}{4}$$

25) If $\cos^{-1}x + \cos^{-1}y + \cos^{-1}z = \pi$ and $0 < x, y, z < 1$, show that $x^2 + y^2 + z^2 + 2xyz = 1$

26) Find the principal value of

$$\sin^{-1}\left(\sin\left(\frac{5\pi}{6}\right)\right)$$

27) Prove that

$$2\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{7} = \tan^{-1}\frac{31}{17}$$

28)

$$\text{Evaluate } \cos\left[\sin^{-1}\frac{3}{5} + \sin^{-1}\frac{5}{13}\right]$$

29)

Prove that $\tan^{-1}\left(\frac{m}{n}\right) - \tan^{-1}\left(\frac{m-n}{m+n}\right) = \frac{\pi}{4}$

30) Solve: $\cos(\tan^{-1}x) = \sin\left(\cot^{-1}\frac{3}{4}\right)$

6 x 5 = 30

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

ii) $\cos^{-1}\left(\cos\left(-\frac{\pi}{3}\right)\right)$

iii) $\cos^{-1}\left(\cos\left(-\frac{7\pi}{6}\right)\right)$

32) Find the domain of $\cos^{-1}\left(\frac{2+\sin x}{3}\right)$

33) Find the domain of the following functions

(i) $f(x) = \sin^{-1}(2x - 3)$

(ii) $f(x) = \sin^{-1}x + \cos x$

34) Simplify $\sin^{-1}\left(\frac{\sin x + \cos x}{\sqrt{2}}\right)$, $\frac{\pi}{4} < x < \frac{\pi}{4}$

35) If $\tan^{-1}\left(\frac{\sqrt{1+x^2} - \sqrt{1-x^2}}{\sqrt{1+x^2} + \sqrt{1-x^2}}\right) = a$ then prove that $x^2 = \sin 2a$

36) Prove that $\tan^{-1}\left(\frac{1-x}{1+x}\right) - \tan^{-1}\left(\frac{1-y}{1+y}\right) = \sin^{-1}\left(\frac{y-x}{\sqrt{1+x^2} \cdot \sqrt{1+y^2}}\right)$

Inverse Trigonometric Functions TEST 8

12th Standard

Maths

Exam Time : 02:30:00 Hrs

Total Marks : 100

20 x 1 = 20

1) The value of $\sin^{-1}(\cos x)$, $0 \leq x \leq \pi$ is

- (a) $\pi - x$ (b) $x - \frac{\pi}{2}$ (c) $\frac{\pi}{2} - x$ (d) $\pi - x$

2) $\sin^{-1}\frac{3}{5} - \cos^{-1}\frac{12}{13} + \sec^{-1}\frac{5}{3} - \operatorname{cosec}^{-1}\frac{13}{2}$ is equal to

- (a) 2π (b) π (c) 0 (d) $\tan^{-1}\frac{12}{65}$

3) $\sin^{-1}(\cos x) = \frac{\pi}{2} - x$ is valid for

- (a) $-\pi \leq x \leq 0$ (b) $0 \leq x \leq \pi$ (c) $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$ (d) $-\frac{\pi}{4} \leq x \leq \frac{3\pi}{4}$

4) If $\cot^{-1}x = \frac{2\pi}{5}$ for some $x \in \mathbb{R}$, the value of $\tan^{-1}x$ is

- (a) $\frac{-\pi}{10}$ (b) $\frac{\pi}{5}$ (c) $\frac{\pi}{10}$ (d) $-\frac{\pi}{5}$

5) If $x = \frac{1}{5}$, the value of $\cos(\cos^{-1}x + 2\sin^{-1}x)$ is

- (a) $-\sqrt{\frac{24}{25}}$ (b) $\sqrt{\frac{24}{25}}$ (c) $\frac{1}{5}$ (d) $-\frac{1}{5}$

6) If the function $f(x)\sin^{-1}(x^2-3)$, then x belongs to

- (a) $[-1, 1]$ (b) $[\sqrt{2}, 2]$ (c) $[-2, -\sqrt{2}] \cup [\sqrt{2}, 2]$ (d) $[-2, -\sqrt{2}] \cap [\sqrt{2}, 2]$

7) $\sin^{-1}\left(\tan\frac{\pi}{4}\right) - \sin^{-1}\left(\sqrt{\frac{3}{x}}\right) = \frac{\pi}{6}$. Then x is a root of the equation

- (a) $x^2 - x - 6 = 0$ (b) $x^2 - x - 12 = 0$ (c) $x^2 + x - 12 = 0$ (d) $x^2 + x - 6 = 0$

8) If $\cot^{-1}(\sqrt{\sin\alpha}) + \tan^{-1}(\sqrt{\sin\alpha}) = u$, then $\cos 2u$ is equal to

- (a) $\tan^2\alpha$ (b) 0 (c) -1 (d) $\tan 2\alpha$

9) The equation $\tan^{-1}x - \cot^{-1}x = \tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$ has

- (a) no solution (b) unique solution (c) two solutions (d) infinite number of solutions

10) If $\sin^{-1}\frac{x}{5} + \operatorname{cosec}^{-1}\frac{5}{4} = \frac{\pi}{2}$, then the value of x is

- (a) 4 (b) 5 (c) 2 (d) 3

11) If $\tan^{-1}\left\{\frac{\sqrt{1+x^2} - \sqrt{1-x^2}}{\sqrt{1+x^2} + \sqrt{1-x^2}}\right\} = \alpha$ then $x^2 =$

- (a) $\sin 2\alpha$ (b) $\sin \alpha$ (c) $\cos 2\alpha$ (d) $\cos \alpha$

12)

The number of solutions of the equation $\tan^{-1} 2x + \tan^{-1} 3x = \frac{\pi}{4}$

- (a) 2 (b) 3 (c) 1 (d) none

13) The number of real solutions of the equation $\sqrt{1 + \cos 2x} = 2\sin^{-1}(\sin x)$, $-\pi < x < \pi$ is

- (a) 0 (b) 1 (c) 2 (d) infinite

14)

$$\tan^{-1}\left(\frac{1}{-4}\right) + \tan^{-1}\left(\frac{2}{11}\right) =$$

- (a) 0 (b) $\frac{1}{2}$ (c) -1 (d) none

15)

The value of $\cos^{-1}\left(\frac{\cos 5\pi}{3}\right) + \sin^{-1}\left(\frac{\sin 5\pi}{3}\right)$ is

- (a) $\frac{\pi}{2}$ (b) $\frac{5\pi}{3}$ (c) $\frac{10\pi}{3}$ (d) 0

16) If $4\cos^{-1}x + \sin^{-1}x = \pi$ then x is

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

17) If $\cos^{-1}x > x > \sin^{-1}x$ then

- (a) $\frac{1}{\sqrt{2}} < x \leq 1$ (b) $0 \leq x < \frac{1}{\sqrt{2}}$ (c) $-1 \leq x < \frac{1}{\sqrt{2}}$ (d) $x > 0$

18)

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

- (a) 7 (b) 6 (c) 5 (d) none

19) The domain of $\cos^{-1}(x^2 - 4)$ is _____

- (a) [3, 5] (b) [-1, 1] (c) $[-\sqrt{5}, -\sqrt{3}] \cup [\sqrt{3}, \sqrt{5}]$ (d) [0, 1]

20) The value of $\sin(2(\tan^{-1} 0.75))$ is _____

- (a) 0.75 (b) 1.5 (c) 0.96 (d) $\sin^{-1}(1.5)$

$$10 \times 2 = 20$$

21)

Find the principal value of $\sin^{-1}\left(-\frac{1}{2}\right)$ (in radians and degrees).

22) Find the period and amplitude of $y = \sin 7x$

23) Is $\cos^{-1}(-x) = \pi - \cos^{-1}(x)$ true? Justify your answer.

24)

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

25) Prove that $\frac{\pi}{2} \leq \sin^{-1}x + 2\cos^{-1}x \leq \frac{3\pi}{2}$.

26)

Show that $\cot(\sin^{-1}x) = \frac{\sqrt{1-x^2}}{x} - 1 \leq x \leq 1$ and $x \neq 0$

27) Find all the values of x such that

$$-8\pi \leq x \leq -8\pi \text{ and } \sin x = -1$$

28) Find the value of

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

29) Find the principal value of

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

30) Find the principal value of

$$\sin^{-1}\left(\sin\left(\frac{5\pi}{6}\right)\right)$$

$$10 \times 3 = 30$$

31) Find the domain of $\sin^{-1}(2-3x^2)$

32) Find the domain of

$$f(x) = \sin^{-1}\left(\frac{|x|-2}{3}\right) + \cos^{-1}\left(\frac{1-|x|}{4}\right)$$

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

34) Prove that

$$\tan^{-1}\frac{1}{2} + \tan^{-1}\frac{1}{3} = \frac{\pi}{4}$$

35) Find the value of

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

36) Find the domain of the following

$$g(x) = 2\sin^{-1}(2x-1) - \frac{\pi}{4}$$

37) Find the value of

$$\cos\left(\sin^{-1}\left(\frac{4}{5}\right) - \tan^{-1}\left(\frac{3}{4}\right)\right)$$

38) Find the value of

$$\cot\left(\sin^{-1}\frac{3}{5} + \sin^{-1}\frac{4}{5}\right)$$

39) Solve

$$\cot^{-1}x - \cot^{-1}(x+2) = \frac{\pi}{12}, x > 0$$

40)

$$\text{Prove that } \cos^{-1}\left(\frac{4}{5}\right) + \tan^{-1}\left(\frac{3}{5}\right) = \tan^{-1}\left(\frac{27}{11}\right)$$

6 x 5 = 30

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

ii) $\cos^{-1}\left(\cos\left(-\frac{\pi}{3}\right)\right)$

iii) $\cos^{-1}\left(\cos\left(-\frac{7\pi}{6}\right)\right)$

42) If $a_1, a_2, a_3, \dots, a_n$ is an arithmetic progression with common difference d , prove that

$$\tan^{-1}\left(\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}\right) = \tan^{-1}\left(\frac{d}{1+a_1a_2}\right) + \tan^{-1}\left(\frac{d}{1+a_2a_3}\right) + \dots + \tan^{-1}\left(\frac{d}{1+a_na_{n-1}}\right) = \frac{a_n - a_1}{1 + a_1a_n}$$

43)

$$\text{Solve } \tan^{-1}\left(\frac{x-1}{x-2}\right) + \tan^{-1}\left(\frac{x+1}{x+2}\right) = \frac{\pi}{4}$$

44)

$$\text{Solve } \cos\left(\sin^{-1}\left(\frac{x}{\sqrt{1+x^2}}\right)\right) = \sin\left\{\cot^{-1}\left(\frac{3}{4}\right)\right\}$$

45)

$$\text{If } \tan^{-1}\left(\frac{\sqrt{1+x^2} - \sqrt{1-x^2}}{\sqrt{1+x^2} + \sqrt{1-x^2}}\right) = a \text{ then prove that } x^2 = \sin 2a$$

46)

$$\text{Prove that } \tan^{-1}\left(\frac{1-x}{1+x}\right) - \tan^{-1}\left(\frac{1-y}{1+y}\right) = \sin^{-1}\left(\frac{y-x}{\sqrt{1+x^2} \cdot \sqrt{1+y^2}}\right)$$

INVERSE TRIGONOMETRY FULL TEST

12th Standard

Maths

Reg.No. :

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Exam Time : 03:00:00 Hrs

ANSWER ALL

Total Marks : 90

20 x 1 = 20

- 1) If $\sin^{-1} x + \sin^{-1} y = \frac{\pi}{2}$ then $\cos^{-1} x + \cos^{-1} y$ is equal to
 (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{3}$
- 2) $\sin^{-1} \left(\frac{1}{\sqrt{2}} \right) + \cos^{-1} \left(\frac{1}{\sqrt{2}} \right) = \Delta$. Then x is a root of the equation
 (a) $x^2 - x - 6 = 0$ (b) $x^2 - x - 12 = 0$ (c) $x^2 + x - 12 = 0$ (d) $x^2 + x - 6 = 0$
- 3) $\sin^{-1}(2\cos^2 x - 1) + \cos^{-1}(1 - 2\sin^2 x) =$
 (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{3}$
- 4) The equation $\tan^{-1} x - \cot^{-1} x = \tan^{-1} \left(\frac{1}{x} \right)$ has
 (a) no solution (b) unique solution (c) two solutions (d) infinite number of solutions
- 5) If $\sin^{-1} \left(\frac{1}{2} \right) = \Delta$, then the value of x is
 (a) 4 (b) 5 (c) 2 (d) 3
- 6) If $x = \frac{\pi}{4}$, the value of $\cos(\cos^{-1} x + 2\sin^{-1} x)$ is
 (a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) $\frac{1}{\sqrt{2}}$ (d) $-\frac{1}{\sqrt{2}}$
- 7) $\sin^{-1} \left(\frac{1}{2} \right) + \cos^{-1} \left(\frac{1}{2} \right) = \Delta$ is equal to
 (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{3}$
- 8) If the function $f(x) = \sin^{-1}(x^2 - 3)$, then x belongs to
 (a) $[-1, 1]$ (b) $[-2, 2]$ (c) $\sqrt{-6} \leq x \leq \sqrt{6}$ (d) $-\sqrt{6} \leq x \leq \sqrt{6}$
- 9) If $\cot^{-1} 2$ and $\cot^{-1} 3$ are two angles of a triangle, then the third angle is
 (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{3}$
- 10) If $\sin^{-1} \left(\frac{1}{2} \right) + \cos^{-1} \left(\frac{1}{2} \right) = \Delta$, then $\cos 2u$ is equal to
 (a) $\tan^2$ (b) 0 (c) -1 (d) $\tan 2$
- 11) If $|x| \leq 1$, then $2\tan^{-1} x - \sin^{-1} \left(\frac{2x}{1+x^2} \right)$ is equal to
 (a) $\tan^{-1} x$ (b) $\sin^{-1} x$ (c) 0 (d) $\frac{\pi}{2}$
- 12) If $\sin^{-1} x + \cot^{-1} 2 = \Delta$, then x is equal to
 (a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\frac{1}{\sqrt{3}}$ (d) $\frac{1}{\sqrt{5}}$
- 13) $\sin(\tan^{-1} x)$, $|x| < 1$ 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) $\frac{1}{\sqrt{1-x^2}}$
- 14) The value of $\sin^{-1}(\cos x)$, 0 is
 (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) $\frac{\pi}{3}$
- 15) $\sin^{-1} \left(\frac{1}{2} \right) + \cos^{-1} \left(\frac{1}{2} \right) = \Delta$ is equal to
 (a) 2 (b) 0 (c) 0 (d) $\tan^{-1} \left(\frac{1}{a} \right)$
- 16) If $\sin^{-1} x = 2\sin^{-1} \left(\frac{1}{2} \right)$ has a solution, then
 (a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\pm \frac{1}{\sqrt{2}}$ (d) $\in \frac{1}{\sqrt{2}}$
- 17) $\sin^{-1}(\cos x) = \Delta$ is valid for

(a) ; (b) ; (c) (d) $\frac{-1}{-5} \frac{-1}{-5} \frac{-1}{-5}$ is $\frac{-1}{-5}$

18) If $\sin^{-1} x + \sin^{-1} y + \sin^{-1} z = \frac{\pi}{2}$, the value of $x^{2017} + y^{2018} + z^{2019}$ is $\frac{\pi}{2}$

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

19) If $\cot^{-1} x = \frac{\pi}{4}$ for some $x \in \mathbb{R}$, the value of $\tan^{-1} x$ is $\frac{\pi}{4}$

(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{6}$

20) The domain of the function defined by $f(x) = \sin^{-1} x$ is $[-1, 1]$

(a) $[1, 2]$ (b) $[-1, 1]$ (c) $[0, 1]$ (d) $[-1, 0]$

ANSWER ANY 7

7 x 2 = 14

21) Find the period and amplitude of

$$y = \sin 7x$$

22) Find the value of $\sin^{-1} \left(\frac{1}{5} \right) + \sin^{-1} \left(\frac{1}{5} \right)$

23) Find the value of $\sin^{-1} \left(\frac{1}{5} \right) + \sin^{-1} \left(\frac{1}{5} \right)$

24) Find the domain of $f(x) = \sin^{-1} \left(\frac{2x-3}{5} \right)$

25) Find the value of $\sin^{-1} \left(\frac{1}{5} \right) + \sin^{-1} \left(\frac{1}{5} \right)$

26) Find the value of $2 \sin^{-1} \left(\frac{1}{5} \right)$

27) Find the value of $\sin^{-1} \left(\frac{1}{5} \right) + \sin^{-1} \left(\frac{1}{5} \right)$

28) Find the value, if it exists. If not, give the reason for non-existence.

$$\sin^{-1}(\cos \theta)$$

29) If $\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \frac{\pi}{2}$, show that $x+y+z=xyz$

30) Prove that $\tan^{-1} \left(\frac{1}{5} \right) + \tan^{-1} \left(\frac{1}{5} \right) = \tan^{-1} \left(\frac{2}{5} \right)$

ANSWER ANY 7

7 x 3 = 21

31) Find the value of $\tan^{-1}(-1) + \cos^{-1} \left(\frac{2}{5} \right)$

32) Prove that $\sin^{-1} \left(\frac{1}{5} \right) + \sin^{-1} \left(\frac{1}{5} \right) = \sin^{-1} \left(\frac{2}{5} \right)$

33) Simplify $\sin^{-1} \left(\frac{1}{5} \right) + \sin^{-1} \left(\frac{1}{5} \right)$

34) Prove that $\tan^{-1} \left(\frac{1}{5} \right) + \tan^{-1} \left(\frac{1}{5} \right) = \tan^{-1} \left(\frac{2}{5} \right)$

35) If $\cos^{-1} x + \cos^{-1} y + \cos^{-1} z = \pi$ and $0 < x, y, z < 1$, show that $x^2 + y^2 + z^2 + 2xyz = 1$

36) Find the principal value of $\beta \in \left(\frac{\pi}{2}, \pi \right)$ such that $\sin \beta = \frac{1}{5}$

37) Prove that $2 \tan^{-1} \left(\frac{1}{5} \right) = \tan^{-1} \left(\frac{2}{5} \right)$

38) Evaluate $\left[\tan^{-1} \left(\frac{1}{5} \right) + \tan^{-1} \left(\frac{1}{5} \right) \right]$

39) Prove that

$$\left(\frac{1}{5} \right) \Delta \frac{1}{5}$$

40) Solve: $\cos(\tan^{-1} x) = \left(\frac{1}{5} \right)$

ANSWER ANY 7

$$7 \times 5 = 35$$

41) Find (i) $\cos^{-1} 2 = 3$

ii) $\cos^{-1} 2 = 33$

iii) $\cos^{-1} 2 = \frac{n}{a} 33$

42) Find the domain of $\cos^{-1} 2 = 3$

43) Find the domain of the following functions

(i) $f(x) = \sin^{-1}(2x - 3)$

(ii) $f(x) = \sin^{-1} x + \cos x$

44) Simplify $\left(\frac{5}{6} \right) \pm \pm$

45) If $\left(\frac{5}{5} \right) \Delta$ then prove that $x^2 = \sin 2a$

46) Prove that $\left(\frac{5}{5} \right) \Delta \left(\frac{5}{5} \right) \Delta \left(\frac{5}{5} \right)$

47) If $a_1, a_2, a_3, \dots$ is an arithmetic progression with common difference d , prove that

$$\tan \Delta \left[\frac{1}{5} \right] < \frac{1}{5} \sqrt{5} < \frac{1}{5} \sqrt{5} 8888 < \frac{1}{5} \sqrt{5} \Delta \frac{1}{5}$$

48) Solve $\left(\frac{1}{5} \right) \Delta \left(\frac{1}{5} \right) \Delta$

49) Solve $\left(\frac{1}{5} \right) \Delta \left(\frac{1}{5} \right) \Delta$

50) Write the function $2 \cdot 3 \Delta \frac{1}{5} \pm \pm$ in the simplest form
