INTERNATIONAL INDIAN SCHOOL BURAIADAH

WORK SHEET-2025-26

SUBJECT: MATHS

Chapter : Inverse Trigonometric Function

MCQ

1- The value of $\sin^{-1}(Cos\frac{13\pi}{5})$ is

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

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

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

3-The value of $\sin^{-1}(Cos\frac{\pi}{9})$ is

$(a)\frac{\pi}{9}$ (b) $\frac{5\pi}{9}$ (c) $-\frac{5\pi}{9}$ (d) $\frac{7\pi}{18}$

4-The value of the expression $2\sec^{-1}2+\sin^{-1}(\frac{1}{2})$

$(a)\ \frac{\pi}{6}$ (b) $\frac{5\pi}{6}$ (c) $\frac{7\pi}{6}$ (d) 1

5-The value of $\tan^{-1}(2Sin\frac{\pi}{3})$ is

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

6-The Value of $\tan^{-1}(1)$ +$\cos^{-1}(-\frac{1}{2})+\sin^{-1}(-\frac{1}{2})$ corresponding to principal branches is

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

7-Domain of $\cot^{-1}x$ is

(a) $(-\frac{\pi}{2},\frac{\pi}{2})$ (b) $(-\infty,\infty)$ (c) $[-\frac{\pi}{2},\frac{\pi}{2}]$ (d) $(0,\pi)$

8- Which of the following corresponds to the principal value branch of $\tan^{-1}x$?

(a) $(-\frac{\pi}{2},\frac{\pi}{2})$ (b) $(0,\pi)$ (c) $[-\frac{\pi}{2},\frac{\pi}{2}]$ (d) $[0,\pi]$

Subjective Questions:

1-Evaluate : $3\sin^{-1}\left(\frac{1}{\sqrt{2}}\right)+2\cos^{-1}(\frac{\sqrt{3}}{2})+\cos^{-1}(0)$ (CBSE-2023)

2-Evaluate $\sin^{-1}(Sin\frac{3\pi}{4})+\cos^{-1}(Cos\pi)+\tan^{-1}(1)$ (CBSE-2023)

3-Evaluate : $\cos^{-1}[Cos(-\frac{7\pi}{3})]$

4-Find the domain of $\sin^{-1}(x^2 - 4)$

5-Find the value of $\sin^{-1}[sin\left(\frac{-17\pi}{8}\right)]$ (CBSE-2020)

6-Find the value of $\tan^{-1}\sqrt{3}$ - $\cot^{-1}(-\sqrt{3})$ (CBSE-2018)

7-Write the principal value of $\cos^{-1} Cos(\frac{7\pi}{6})$ (CBSE-2009,2011)

8-Find the value of $\sin^{-1}(Cos(\frac{43\pi}{5}))$

9-Draw the graph of $f(x) = \sin^{-1} x$, $x \in [-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}]$ $also\ write\ the\ range\ of\ f(x)$

10-Draw the graph of $\cos^{-1} x$, $where\ x \in [-1,0], also\ write\ its\ range$.

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Assertion -Reason Questions

The following questions consist of two statements -Assertion (A) and Reason(R) .Answer these questions selecting the appropriate option given below :

(a) Both A and R true and R is the correct explanation for A.
(b) Both A and R are true but R is not the correct explanation for A
(c) A is true but R is false.
(d) A is false but R is true .

1-**Assertion (A**): A line through the points (4,7 ,8) and (2 ,3,4) is parallel to a line through the points (-1 , -2 , 1) and (1 ,2 ,5)

Reason (R) Lines $\vec{r}$= $\vec{a}_1 + \lambda\vec{b}_1$ and $\vec{r}$= $\vec{a}_2 + \mu\vec{b}_2$ are parallel if $\vec{b}_1 . \vec{b}_2 = 0$ *(CBSE-2023)*

2- ***Assertion (A)*** *:Equation of line passing through the points (1 ,2 ,3) and (3 , -1 ,3) is*

$\frac{x-3}{2} = \frac{y+1}{3} = \frac{z-3}{0}$

Reason (R) : Equation of line passing through points (x_1, y_1, z_1) and (x_2, y_2, z_2) is given by $\frac{x-x_1}{x_2-x_1} = \frac{y-y_1}{y_2-y_1} = \frac{z-z_1}{z_2-z_1}$

Subjective Questions:

1-Write the direction cosines of a line parallel to Z-axis (CBSE-2012)

2-Find the value of p , so that lines $\frac{x-1}{-2} = \frac{y-4}{3p} = \frac{z-3}{4}$ and $\frac{x-2}{4p} = \frac{y-5}{2} = \frac{1-z}{7}$ are perpendicular to each other.(CBSE-2023)

3- Find the vector and the cartesian equations of a line that passes through the point A (1 ,2 ,-1) and parallel to the line $5x - 25 = 14 - 7y = 35z$. (CBSE-2023)

4-Find the coordinates of points on line $\frac{x}{1} = \frac{y-1}{2} = \frac{z+1}{2}$ which are at a distance of $\sqrt{11}$ units from origin.(CBSE-2019)

5-Show that the line through the points (1 , -1 ,2) (3 , 4 ,-2) is perpendicular to the line through the points (0 , 3 ,2) and (3 ,5 ,6)

6-Find the equation of the line which passes through the point (1 , 2 ,3) and is parallel to the vector $3\hat{\imath} + 2\hat{\jmath} - 2\hat{k}$.

7-Find the coordinate of the foot of the perpendicular drawn from the point P(0,2 ,3) to the line $\frac{x+3}{5} = \frac{y-1}{2} = \frac{z+4}{3}$ **(CBSE-2023)**

8-Find the vector and cartesian equations of the line passing through the point (1 , 2 ,- 4) and perpendicular to the two lines $\frac{x-8}{3} = \frac{y+19}{-16} = \frac{z-10}{7}$ and $\frac{x-15}{3} = \frac{y-29}{8} = \frac{z-5}{-5}$.(CBSE-2012,2017)

9-Find the equation of a line passing through the point (1 ,2 ,-4) and perpendicular to two lines $\vec{r} = 8\hat{\imath} - 19\hat{\jmath} + 10\hat{k} + \lambda(3\hat{\imath} - 16\hat{\jmath} - 7\hat{k})$ and $\vec{r} = 15\hat{\imath} + 29\hat{\jmath} + 5\hat{k} + \mu(3\hat{\imath} + 8\hat{\jmath} - 5\hat{k})$ (CBSE-2015)

10-Find the shortest distance between the following lines :

$\frac{x-3}{1} = \frac{y-5}{-2} = \frac{z-7}{1}$ and $\frac{x+1}{7} = \frac{y+1}{-6} = \frac{z+1}{1}$ (CBSE-2008 , 2013 ,2014)

11-Find the value of b so that the lines $\frac{x-1}{2} = \frac{y-b}{3} = \frac{z-3}{4}$ and $\frac{x-4}{5} = \frac{y-1}{2} = z$ are intersecting lines .Also ,find the point of intersection of these given lines. (CBSE-2023)

12-Find the equations of all the sides of the parallelogram ABCD whose vertices are A(4 , 7 ,8) ,B(2,3,4),C(-1 , -2 ,1) and D (1,2,5) .Also ,find the coordinates of the foot of perpendicular from A to CD

13-Find the vector and the cartesian equations of a line passing through the point (1 , 2 ,-4) and parallel to the line joining the points A(3 ,3 ,-5) and B (1 ,0 ,-11) Hence find the distance between the two lines.

14-Find the value of a + b +c where (a , b ,c) is the image of (1,2 -3) in the line $\frac{x+1}{2} = \frac{y-3}{-2} = \frac{z}{-1}$

15-If a point R (4 , y ,z) lies on the line segment joining the points P(2 , -3 ,4) and Q (8, 0 ,10) .Find the distance of R from origin.

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