MATHEMATICS MCQ FOR 1ST SEM.2021

CO-ORDINATE GEOMETRY OF 2D AND 3D

Question 1.
The direction cosines of the y-axis are
(a) (6, 0, 0)
(b) (1, 0, 0)
(c) (0, 1, 0)
(d) (0, 0, 1)

Answer: (c) (0, 1, 0)

Question 2.
The direction ratios of the line joining the points (x, y, z) and (x_2, y_2, z_1) are
(a) $x_1 + x_2$, $y_1 + y_2$, $z_1 + z_2$
(b) (x1–x2)2+(y1–y2)2+(z1+z2)2——————————————————————√
(c) x1+x22, y1+y22, z1+z22
(d) $x_2 – x_1$, $y_2 – y_1$, $z_2 – z_1$

Answer: (d) $x_2 – x_1$, $y_2 – y_1$, $z_2 – z_1$

Question 3.

The coordinates of the midpoints of the line segment joining the points (2, 3, 4) and (8, -3, 8) are

(a) (10, 0, 12)

(b) (5, 6, 0)

(c) (6, 5, 0)

(d) (5, 0, 6)

Answer: (d) (5, 0, 6)

Question 4.

If the planes a1x + b, y + c, z + d1 = 0 and a2x + b, y + c2z + d2 = 0 are perpendicular to each other then

(a) a1a2 = b1b2 = c1c2

(b) a1a2 + b1b2, c1c2

(c) a1a2 + b1b2 + c1c2 = 0

(d) a21a22 + b21b22 + c21c22 = 0

Answer: (c) a1a2 + b1b2 + c1c2 = 0

Question 5.

The distance of the plane 2x – 3y + 6z + 7 = 0 from the point (2, -3, -1) is

(a) 4

(b) 3

(c) 2

(d) 15

Answer: (c) 2

Question 6.

The direction cosines of the normal to the plane 2x – 3y – 6z – 3 = 0 are

(a) 27, −37, −67

(b) 27, 37, 67

(c) −27, −37, −67

(d) None of these

Answer: (a) 27, −37, −67

Question 7.

If 2x + 5y – 6z + 3 = 0 be the equation of the plane, then the equation of any plane parallel to the given plane is

(a) 3x + 5y – 6z + 3 = 0

(b) 2x – 5y – 6z + 3 = 0

(c) 2x + 5y – 6z + k = 0

(d) None of these

Answer: (c) 2x + 5y – 6z + k = 0

Question 8.

(2, – 3, – 1) 2x – 3y + 6z + 7 = 0

(a) 4

(b) 3

(c) 2

(d) 15 Answer: (c) 2

Question 9.

The length of the ⊥er from the point (0, – 1, 3) to the plane 2x + y – 2z + 1 = 0 is

(a) 0

(b) 2√3

(c) 23

(d) 2

Answer: (d) 2

Question 10.

The direction cosines of the line joining (1, -1, 1) and (-1, 1, 1) are

(a) 2, -2, 0

(b) 1, -1, 0

(c) 1√2, – 1√2

(d) None of these

Answer: (c) 1√2, – 1√2

Question 11.

The distance of the point (-3, 4, 5) from the origin

(a) 50

(b) 5√2

(c) 6

(d) None of these

Answer: (b) 5√2

Question 12.

The direction ratios of a line are 1,3,5 then its direction cosines are

(a) 135√, 335√, 535√

(b) 19, 13, 59

(c) 535√, 335√, 135√

(d) None of these

Answer: (a) 135√, 335√, 535√

Question 13.

The direction ratios of the normal to the plane 7x + 4y – 2z + 5 = 0 are

(a) 7, 4,-2

(b)7, 4, 5

(c) 7, 4, 2

(d) 4, -2, 5

Answer: (a) 7, 4,-2

Question 14.

The direction ratios of the line of intersection of the planes 3x + 2y – z = 5 and x – y + 2z = 3 are

(a) 3, 2, -1

(b) -3, 7, 5

(c) 1, -1, 2

(d) – 11, 4, -5

Answer: (b) -3, 7, 5

Question 15.

The equation of the plane through the origin and parallel to the plane 3x – 4y + 5z + 6 = 0

(a) 3x – 4y – 5z – 6 = 0

(b) 3x – 4y + 5z + 6 = 0

(c) 3x – 4y + 5z = 0

(d) 3x + 4y – 5z + 6 = 0

Answer: (c) 3x – 4y + 5z = 0

Question 16.

If the direction ratios of a line are 1, -3, 2, then its direction cosines are

(a) $\frac{1}{\sqrt{14}}, \frac{-3}{\sqrt{14}}, \frac{2}{\sqrt{14}}$ (b) $\frac{1}{\sqrt{14}}, \frac{2}{\sqrt{14}}, \frac{3}{\sqrt{14}}$

(c) $\frac{-1}{\sqrt{14}}, \frac{-3}{\sqrt{14}}, \frac{2}{\sqrt{14}}$ (d) $\frac{-1}{\sqrt{14}}, \frac{-2}{\sqrt{14}}, \frac{-3}{\sqrt{14}}$

Answer: (a)

Question 17.

Find the direction cosines of the line joining A(0, 7, 10) and B(-1, 6, 6).

(a) $\frac{-1}{3\sqrt{2}}, \frac{-1}{3\sqrt{2}}, \frac{2}{3\sqrt{2}}$ (b) $\frac{1}{3\sqrt{2}}, \frac{1}{3\sqrt{2}}, \frac{4}{3\sqrt{2}}$

(c) $\frac{1}{3}, \frac{-1}{3}, \frac{4}{3}$ (d) None of these

Answer: (b)

18: Find the equation of circle whose centre is (0,0) and radius 3units.

A) $x^2 + y^2 = 4$ b) $x^2 + y^2 = 0$

c) $x^2 + y^2 = 9$ c) $(x-3)^2 - y^2 = 9$

Answer : (C)

19: Find the radius of the circle $x^2 + y^2 - 6x - 4y + 9 = 0$

a) 4
b) 3
c) 2
d) 1

Answer (c)

20: Find the radius of the circle $(x-3)^2 + (y+2)^2 = 25$

a) 3
b) 25
c) 5
d) 2

Ans: (c)

21: Find the centre of the circle $x^2 + y^2 - 2x - 8y - 1 = 0$

a) (1,4)
b) (4,1)
c) (-1,4)

d) (4,-1)

Ans : (a)

22: Find the centre of the sphere $x^2 + y^2 + z^2 – 2x -6y +8z + 1=0$

a) (1,3,4)
b) (-1,-3,4)
c) (1,3,-4)
d) (1,-3,-4)

Ans : (c)

23: Find the radius of the sphere $(x-2)^2 + (y- 3)^2 + (z+ 2)^2 = 25$

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

Ans : (b)

24: Find the centre of the sphere $(x - 1)^2 + (y+2)^2 +(z- 3)^2 = 4$

a) (1,-2,-3)
b) (1,2,3)
c) (-1,2,3)
d) (1,-2,3)

Ans : (d)

Determinants and Matrices Maths MCQs

Question 1.

Find the adjoint of the matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$.

(a) $\begin{bmatrix} 4 & 2 \\ 3 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}$

(c) $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & -2 \\ -3 & 4 \end{bmatrix}$

Answer: (b)

Question 2.

Find the adjoint of the matrix A, where $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 5 & 0 \\ 2 & 4 & 3 \end{bmatrix}$

(a) $\begin{bmatrix} 15 & 6 & 1 \\ 0 & 3 & 0 \\ 10 & 0 & 5 \end{bmatrix}$ (b) $\begin{bmatrix} 15 & 6 & -15 \\ 0 & -3 & 0 \\ -10 & 0 & 5 \end{bmatrix}$

(c) $\begin{bmatrix} 15 & -1 & 5 \\ 0 & 3 & 1 \\ 10 & 1 & 5 \end{bmatrix}$ (d) None of these

Answer:(b)

Question 3.

If $A = \begin{bmatrix} 2 & 3 \\ 1 & -4 \end{bmatrix}$ **and** $B = \begin{bmatrix} 1 & -2 \\ -1 & 3 \end{bmatrix}$**, then find** $(AB)^{-1}$.

(a) $\frac{1}{11}\begin{bmatrix} 14 & 5 \\ 5 & 1 \end{bmatrix}$ (b) $\frac{1}{11}\begin{bmatrix} 14 & -5 \\ -5 & 1 \end{bmatrix}$

(c) $\frac{1}{11}\begin{bmatrix} 1 & 5 \\ 5 & 14 \end{bmatrix}$ (d) $\frac{1}{11}\begin{bmatrix} 1 & -5 \\ -5 & 14 \end{bmatrix}$

Answer: (a

Question 4.

If $A = \begin{bmatrix} 2 & -3 \\ 3 & 4 \end{bmatrix}$**, then find** A^{-1}.

(a) $\frac{1}{17}\begin{bmatrix} 2 & 3 \\ -3 & 4 \end{bmatrix}$ (b) $\frac{1}{17}\begin{bmatrix} 4 & 3 \\ -3 & 2 \end{bmatrix}$

(c) $\frac{-1}{17}\begin{bmatrix} 4 & 3 \\ -3 & 2 \end{bmatrix}$ (d) $\frac{1}{17}\begin{bmatrix} 4 & 3 \\ -3 & -2 \end{bmatrix}$

Answer: (b)

Question 5.

Find the minor of the element of second row and third column in the following determinant

$$\begin{bmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{bmatrix}$$

(a) 13
(b) 4
(c) 5
(d) 0
Answer: (a) 13

Question 6
If $\Delta = \begin{bmatrix} 5 & 3 & 1 \\ 2 & 0 & 1 \\ 1 & 2 & 3 \end{bmatrix}$ then write the minor of the element a_{23}.
(a) 7
(b) -7
(c) 4
(d) 8
Answer:
(a) 7

Question 7.
Find the adjoint of the matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$.

(a) $\begin{bmatrix} 4 & 2 \\ 3 & 1 \end{bmatrix}$ (b) $\begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}$

(c) $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & -2 \\ -3 & 4 \end{bmatrix}$

Answer: (b)

Question 8.

Find the adjoint of the matrix A, where $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 5 & 0 \\ 2 & 4 & 3 \end{bmatrix}$

(a) $\begin{bmatrix} 15 & 6 & 1 \\ 0 & 3 & 0 \\ 10 & 0 & 5 \end{bmatrix}$ (b) $\begin{bmatrix} 15 & 6 & -15 \\ 0 & -3 & 0 \\ -10 & 0 & 5 \end{bmatrix}$

(c) $\begin{bmatrix} 15 & -1 & 5 \\ 0 & 3 & 1 \\ 10 & 1 & 5 \end{bmatrix}$ (d) None of these

Answer: (b)

Question 9.

Find x, if $\begin{bmatrix} 5 & 3 & 1 \\ 2 & 0 & 1 \\ 1 & 2 & -7 \end{bmatrix}$ is singular

(a) 1

(b) 2

(c) 3

(d) 4

Answer:

(d) 4

Question 10.

If $\begin{bmatrix} 2+x & 3 & 4 \\ 1 & -1 & 2 \\ x & 1 & -5 \end{bmatrix}$ **is a singular matrix, then x is**

(a) $\frac{13}{25}$ (b) $-\frac{25}{13}$

(c) $\frac{5}{13}$ (d) $\frac{25}{13}$

Answer: (b)

Question 11.

The maximum value of $\begin{vmatrix} 1 & 1 & 1 \\ 1 & 1+\sin\theta & 1 \\ 1+\cos\theta & 1 & 1 \end{vmatrix}$ **is (θ is real number)**

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

(c) $\sqrt{2}$ (d) $\frac{2\sqrt{3}}{4}$

Answer:

(a) 12

Question 12.

For what value of x, matrix $\begin{bmatrix} 6-x & 4 \\ 3-x & 1 \end{bmatrix}$ is a singularmatrix?

(a) 1

(b) 2

(c) -1

(d) -2

Answer:

(b) 2

Question 13.

Compute $(AB)^{-1}$, If

$$A=\begin{bmatrix} 1 & 1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix} \text{ and } B^{-1}=\begin{bmatrix} 1 & 2 & 0 \\ 0 & 3 & -1 \\ 1 & 0 & 2 \end{bmatrix}$$

(a) $\frac{1}{19}\begin{bmatrix} 16 & 12 & 1 \\ 21 & 11 & -7 \\ 10 & -2 & 3 \end{bmatrix}$ (b) $\frac{1}{19}\begin{bmatrix} 16 & 12 & 10 \\ 21 & 11 & -2 \\ 1 & -7 & 3 \end{bmatrix}$

(c) $\frac{1}{19}\begin{bmatrix} 16 & 12 & 1 \\ -21 & -11 & 7 \\ 10 & -2 & 3 \end{bmatrix}$ (d) $\frac{1}{19}\begin{bmatrix} 16 & -21 & 1 \\ 21 & 11 & 7 \\ 10 & -2 & 3 \end{bmatrix}$

Answer: (a)

Question 14.

If $A=\begin{bmatrix}0 & 1 & 1\\ 1 & 0 & 1\\ 1 & 1 & 0\end{bmatrix}$ then $\frac{A^2-3I}{2}=$

(a) A^{-1} (b) $2A$

(c) $2A^{-1}$ (d) $\frac{3}{2}A^{-1}$

Answer:
(a) A^{-1}

Question 15.

If $A=\begin{bmatrix}2 & 3\\ 1 & -4\end{bmatrix}$ and $B=\begin{bmatrix}1 & -2\\ -1 & 3\end{bmatrix}$, then find $(AB)^{-1}$.

(a) $\frac{1}{11}\begin{bmatrix}14 & 5\\ 5 & 1\end{bmatrix}$ (b) $\frac{1}{11}\begin{bmatrix}14 & -5\\ -5 & 1\end{bmatrix}$

(c) $\frac{1}{11}\begin{bmatrix}1 & 5\\ 5 & 14\end{bmatrix}$ (d) $\frac{1}{11}\begin{bmatrix}1 & -5\\ -5 & 14\end{bmatrix}$

Answer: (a)
Question 16.

If $A=\begin{bmatrix}2 & -3\\ 3 & 4\end{bmatrix}$, then find A^{-1}.

(a) $\frac{1}{17}\begin{bmatrix}2 & 3\\ -3 & 4\end{bmatrix}$ (b) $\frac{1}{17}\begin{bmatrix}4 & 3\\ -3 & 2\end{bmatrix}$

(c) $\frac{-1}{17}\begin{bmatrix}4 & 3\\ -3 & 2\end{bmatrix}$ (d) $\frac{1}{17}\begin{bmatrix}4 & 3\\ -3 & -2\end{bmatrix}$

Answer: (b)
Question 17.
Find the minor of the element of second row and third column in the following determinant

$\begin{bmatrix}2 & -3 & 5\\ 6 & 0 & 4\\ 1 & 5 & -7\end{bmatrix}$

(a) 13
(b) 4
(c) 5
(d) 0
Answer: (a) 13

Question 18.
If

$$\begin{bmatrix} 2x & 5 \\ 8 & x \end{bmatrix} = \begin{bmatrix} 6 & -2 \\ 7 & 3 \end{bmatrix}$$

then the value of x is
(a) 3
(b) ±3
(c) ±6
(d) 6
Answer:
(c) ±6

Question 19.
Find the minor of 6 and cofactor of 4 respectively in the determinant $\Delta =$

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

(a) 6, 6
(b) 6, -6
(c) -6, -6
(d) -6, 6
Answer:
(d) -6, 6

20 . Transpose of a rectangular matrix is a

A. scaler matrix

B. square matrix

C. diagonal matrix

D. rectangular matrix

Answer: D

21 . Transpose of a column matrix is

A. row matrix B. zero matrix

C. column matrix

D. diagonal matrix

Answer: A

22 . Two matrices A and B are multiplied to get AB if

A. both are rectangular

B. both have same order

C. no of columns of A is equal to columns of B

D. no of rows of A is equal to no of columns of B

Answer: C

23. If $|A| = 0$, then A is

A. 0

B. zero matrix

C. singular matrix

D. non-singular matrix

Answer: C

24 . Additive inverse of a matrix A is

A. adj $A/|A|$ B. A^2

C. $|A|$

D. A

Answer: A

25 . Two matrices A and B are multiplied to get BA if

A. no of rows of A is equal to no of columns of B

B. no of columns of A is equal to columns of B

C. both have same order

D. both are rectangular

Answer: A

26 . A matrix having m rows and n columns with $m \neq n$ is said to be a

A. scaler matrix

B. identity matrix

C. square matrix

D. rectangular matrix

Answer: A

27 . [a b c] is a

A. zero matrix

B. row matrix

C. column matrix

D. diagonal matrix

Answer: B

28 . Two matrices A and B are added if

A. no of rows of A is equal to no of columns of B

B. no of columns of A is equal to columns of B

C. both have same order

D. both are rectangular

Answer: C

29 . Transpose of a row matrix is

A. zero matrix

B. row matrix

C. column matrix D. diagonal matrix

Answer: C

30 . Matrices obtained by changing rows and columns is called

A. symetric

B. transpose

C. rectangular matrix

D. None of Above

Answer: B

31 . [0 0 0] is

A. null matrix B. Scalar matrix

C. identity matrix

D. diagonal matrix

Answer: A

32 . If A is a matrix of order m x n and B is a matrix of order n x p then order of AB is

A. p x n

B. m x p

C. p x m

D. n x p

Answer: B

33 . Transpose of a square matrix is a

A. scalar matrix

B. square matrix

C. diagonal matrix

D. rectangular matrix

Answer: C

34 . If $|A| \neq 0$, then A is

A. non - singular matrix

B. singular matrix

C. diagonal matrix

D. zero matrix

Answer: A

35 . Two matrices A and B are equal if

A. both are rectangular

B. both have same order

C. no of columns of A is equal to columns of B

D. both have same order and equal corresponding elements

Answer: D

36 . Order of a matrix [2 5 7] is

A. 1 x 1

B. 1 x 3

C. 3 x 1

D. 3 x 3

Answer: B

37 . A matrix having m rows and n columns with m = n is said to be a

A. scaler matrix

B. identity matrix

C. square matrix

D. rectangular matrix

Answer: C

38 . Equations having a common solution are called

A. linear equations

B. simultaneous equations

C. homogeneous equations

D. None of Above

Answer: C

39 . If a matrix has m rows and n columns then order is

A. m x n B. m x m

C. m + n

D. n x n

Answer: A

Trigonometry

1.The value of cos 0°. cos 1°. cos 2°. cos 3°… cos 89° cos 90° is
(a) 1
(b) -1
(c) 0
(d) 12√

Answer: c

2. If x tan 45° sin 30° = cos 30° tan 30°, then x is equal to
(a) √3
(b) 12
(c) 12√
(d) 1

Answer : d

3. If x and y are complementary angles, then
(a) sin x = sin y
(b) tan x = tan y
(c) cos x = cos y
(d) sec x = cosec y

Answer: d

4. If A, B and C are interior angles of a ΔABC then cos(B+C2) is equal to

(a) $\sin \frac{A}{2}$ (b) $-\sin \frac{A}{2}$

(c) $\cos \frac{A}{2}$ (d) $-\cos \frac{A}{2}$

Answer: a

5. If y sin 45° cos 45° = tan2 45° – cos2 30°, then y = …
(a) –12
(b) 12
(c) -2
(d) 2
Answer: b

6. 5 tan² A – 5 sec² A + 1 is equal to
(a) 6
(6) -5
(c) 1
(d) -4
Answer: d

7. If sec A + tan A = x, then sec A =

(a) $\frac{x^2-1}{x}$ (b) $\frac{x^2-1}{2x}$

(c) $\frac{x^2+1}{x}$ (d) $\frac{x^2+1}{2x}$

Answer: d

8. If sec A + tan A = x, then tan A =

(a) $\frac{x^2-1}{x}$ (b) $\frac{x^2-1}{2x}$

(c) $\frac{x^2+1}{x}$ (d) $\frac{x^2+1}{2x}$

Answer: b

9. What is the maximum value of $1\csc A$?
(a) 0
(b) 1
(c) 12
(d) 2

Answer: b

10. What is the minimum value of sin A, $0 \leq A \leq 90°$
(a) -1
(b) 0
(c) 1
(d) 12

Answer : b

11. What is the minimum value of cos θ, $0 \leq \theta \leq 90°$
(a) -1
(b) 0
(c) 1
(d) 12

Answer: b

12. (Sin 30°+cos 60°)-(sin 60° + cos 30°) is equal to:

(a)0

(b)$1+2\sqrt{3}$

(c)$1-\sqrt{3}$

(d)$1+\sqrt{3}$

Answer: c

13. The value of tan 60°/cot 30° is equal to:

(a)0

(b)1

(c)2

(d)3

Answer: b

14. 1-cos^{2}A is equal to:

(a)sin^{2}A

(b)tan^{2}A

(c)1-sin^{2}A

(d)sec^{2}A

Answer: a

15. Sin (90° – A) and cos A are:

(a)Different

(b)Same

(c)Not related

(d)None of the above

Answer: b

16. If cos X=a/b, then sin X is equal to:

(a)b^2-a^2/b

(b)b-a/b

(c)√(b^2-a^2)/b

(d)√(b-a)/b

Answer: (c)

17. The value of sin 60° cos 30° + sin 30° cos 60° is:

(a)0

(b)1

(c)2

(d)4

Answer: b

18. $2\tan 30°/1+\tan^2 30°$ =

(a)Sin 60°

(b)Cos 60°

(c)Tan 60°

(d)Sin 30°

Answer: a

19. sin 2A = 2 sin A is true when A =

(a)30°

(b)45°

(c)0°

(d)60°

Answer: (c)

20. Given that $\sin\theta = \frac{a}{b}$, then $\tan\theta$ =

(a) $\frac{b}{\sqrt{b^2-a^2}}$ **(b)** $\frac{\sqrt{b^2-a^2}}{b}$

(c) $\frac{a}{\sqrt{b^2-a^2}}$ **(d)** $\frac{\sqrt{b^2-a^2}}{a}$

Answer: c

21. If $\sin A - \cos A = 0$, then the value of $\sin^4 A + \cos^4 A$ is
(a) 2
(b) 1
(c) 34
(d) 12

Answer: d

22. (sin30° + cos30°) – (sin 60° + cos60°)

(A) – 1

(B) 0

(C) 1

(D) 2

Answer: (B)

23. Value of tan30°/cot60° is:

(A) $1/\sqrt{2}$

(B) $1/\sqrt{3}$

(C) $\sqrt{3}$

(D) 1

Answer: (D)

24. $\sec^2\theta - 1 = ?$

(A) $\tan^2\theta$

(B) $\tan^2\theta + 1$

(C) $\cot^2\theta - 1$

(D) $\cos^2\theta$

Answer: (A)

25. The value of sin θ and cos (90° – θ)

(A) Are same

(B) Are different

(C) No relation

(D) Information insufficient

Answer: (A)

26. If cos A = 4/5, then tan A = ?

(A) 3/5

(B) 3/4

(C) 4/3

(D) 4/5

Answer: (B)

27. The value of the expression [cosec (75° + θ) – sec (15° - θ) – tan (55° + θ) + cot (35° - θ)] is

(A) 1

(B) −1

(C) 0

(D) 1/2

Answer: (C)

28. Given that: SinA = a/b, then cosA = ?

(A) $\frac{\sqrt{b^2+a^2}}{b}$

(B) $\frac{\sqrt{b^2-a^2}}{b}$

(C) b/a

(D) a/b

Answer:(B)

29. The value of (tan1° tan2° tan3° ... tan89°) is

(A) 0

(B) 1

(C) 2

(D)1/2

Answer: (B)

30. If sin A = 1/2 and cos B = 1/2, then A + B = ?

(A) 0^0

(B) 30^0

(C) 60^0

(D) 90^0

Answer: (D)

(D) 0

31. If cos (A + B) = 0, then sin (A – B) is reduced to:

(A) cos A

(B) cos 2B

(C) sin A

(D) sin 2B

Answer: (B)

32.Solve for x : $\{x\cos(\cot^{-1} x) + \sin(\cot^{-1} x)\}^2 = 5150$

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

(b) $\frac{1}{5\sqrt{2}}$

(c) $2\sqrt{2}$

(d) $5\sqrt{2}$

Answer:

(b)

33.

The value of $\tan^{-1}\left(\frac{1}{2}\right) + \tan^{-1}\left(\frac{1}{3}\right) + \tan^{-1}\left(\frac{7}{8}\right)$ is

(a) $\tan^{-1}\left(\frac{7}{8}\right)$

(b) $\cot^{-1}(15)$

(c) $\tan^{-1}(15)$

(d) $\tan^{-1}\left(\frac{25}{24}\right)$

Answer:

(c) $\tan^{-1}(15)$

34.

Solve for x : $\sin^{-1} 2x + \sin^{-1} 3x = \frac{\pi}{3}$

(a) $\sqrt{\frac{76}{3}}$ (b) $\sqrt{\frac{3}{76}}$

(c) $\frac{3}{\sqrt{76}}$ (d) $\frac{\sqrt{3}}{76}$

Answer:

(b) $\sqrt{\frac{3}{76}}$

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The value of $\tan^{-1}\left(\frac{3}{4}\right) + \tan^{-1}\left(\frac{1}{7}\right)$ is

(a) π (b) $\frac{\pi}{2}$

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

Answer:

(d) $\pi/4$

36.

If $\cos^{-1} x + \sin^{-1} x = \pi$, then the value of x is

(a) 32

(b) 12√

(c) 3√2

(d) 23√

Answer:

(c) 3√2

37.

If $\sin^{-1} x - \cos^{-1} x = \pi/6$, then x =

(a) 1/2

(b) $\frac{\sqrt{3}}{2}$

(c) −1/2

(d) $-\frac{\sqrt{3}}{2}$

Answer:

(b)

38.

If $\tan^{-1}(\cot \theta) = 2\theta$, then θ is equal to

(a) $\pi/3$

(b) $\pi/4$
(c) $\pi/6$
(d) None of these
Answer:
(c) $\pi/6$

39.
$\cot(\pi/4 - 2\cot^{-1} 3) =$
(a) 7
(b) 6
(c) 5
(d) None of these
Answer:
(a) 7

40.
If $\tan^{-1} 3 + \tan^{-1} x = \tan^{-1} 8$, then x =
(a) 5
(b) 1/5
(c) 5/14
(d) 1/45
Answer:
(b) 1/5

41.
$$\sin^{-1}\left(\frac{-1}{2}\right)$$

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

(c) $\frac{\pi}{6}$ (d) $-\frac{\pi}{6}$

Answer:
(d) $-\pi/6$

42.
$$\cos^{-1}\left(\frac{1}{2}\right)$$

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

(c) $\frac{\pi}{2}$ (d) $\frac{2\pi}{3}$

Answer:
(b) $\pi/3$

43.

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

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{3}$

(c) $\frac{2\pi}{3}$ (d) $\frac{5\pi}{6}$

Answer:
(b) $\pi/3$

44.

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

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

(c) $\frac{\pi}{6}$ (d) $\frac{\pi}{2}$

Answer:
(a) $\pi/4$

45.

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

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

(c) $\frac{\pi}{2}$ (d) 6π

Answer:
(b) $3\pi/4$

46.

$\cos^{-1}\frac{1}{2} + 2\sin^{-1}\frac{1}{2}$ is equal to

(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{6}$

(c) $\frac{\pi}{3}$ (d) $\frac{2\pi}{3}$

Answer:
(d) $2\pi/3$

47.

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

(a) $\tan^2\left(\frac{\alpha}{2}\right)$ (b) $\cot^2\left(\frac{\alpha}{2}\right)$

(c) $\tan\alpha$ (d) $\cot\left(\frac{\alpha}{2}\right)$

Answer:
(a)

48.

The value of $\cot\left(\text{cosec}^{-1}\frac{5}{3} + \tan^{-1}\frac{2}{3}\right)$ is

(a) $\frac{5}{17}$ (b) $\frac{6}{17}$

(c) $\frac{3}{17}$ (d) $\frac{4}{17}$

Answer:
(b) 6/17

49.

If $\tan^{-1}(x-1) + \tan^{-1}x + \tan^{-1}(x+1) = \tan^{-1}3x$, then the values of x are

(a) ±12

(b) 0, 12

(c) 0, −12

(d) 0, ±12

Answer:
(d) 0, ±12

50.

$\sin\left\{2\cos^{-1}\left(\frac{-3}{5}\right)\right\}$ is equal to

(a) $\frac{6}{25}$ (b) $\frac{24}{25}$

(c) $\frac{4}{5}$ (d) $-\frac{24}{25}$

Answer:

(d) −24/25

51.

$\sin^{-1}(1-x) - 2\sin^{-1}x = \pi/2$

(a) 0

(b) 1/2
(c) 0, 1/2
(d) -1/2
Answer:
(a) 0

52.
$2\tan^{-1}(\cos x) = \tan^{-1}(2\operatorname{cosec} x)$
(a) 0
(b) π/3
(c) π/4
(d) π/2
Answer:
(c) π/4

53.
$\sin[\cot^{-1}\{\cos(\tan^{-1} x)\}] =$

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

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

Answer:
(a)

54.
The value of $\cos^{-1}\left(\cos\left(\frac{33\pi}{5}\right)\right)$ is

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

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

Answer:
(a) 3π/5

55.

The value of $\sin\left[\cos^{-1}\left(\frac{7}{25}\right)\right]$ is

(a) $\frac{25}{24}$ (b) $\frac{25}{7}$

(c) $\frac{24}{25}$ (d) $\frac{7}{24}$

Answer:
(c) 24/25

56.

$$\cot\left(\text{cosec}^{-1}\frac{5}{3}+\tan^{-1}\frac{2}{3}\right)=$$

(a) $\frac{6}{17}$ (b) $\frac{3}{17}$

(c) $\frac{4}{17}$ (d) $\frac{5}{17}$

Answer:
(a) 6/17

57.

$$\text{The value of } \tan\left(\cos^{-1}\frac{4}{5}+\tan^{-1}\frac{2}{3}\right)=$$

(a) $\frac{6}{17}$ (b) $\frac{7}{16}$

(c) $\frac{16}{7}$ (d) none of these

Answer:
(d) none of these

58.

$$\cos\left(2\tan^{-1}\frac{1}{7}\right)-\sin\left(4\sin^{-1}\frac{1}{3}\right)=$$

(a) 1 (b) 0

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

Answer:
(b) 0

59.

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

(a) π (b) $\frac{\pi}{2}$

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

Answer:
(c) $\pi/4$

60.

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

(a) x (b) $\frac{1}{x}$

(c) $2x$ (d) $\frac{2}{x}$

Answer:
(d) $2x$

61.

$3\tan^{-1}a$ is equal to

(a) $\tan^{-1}\left(\frac{3a+a^3}{1+3a^2}\right)$ (b) $\tan^{-1}\left(\frac{3a-a^3}{1+3a^2}\right)$

(c) $\tan^{-1}\left(\frac{3a+a^3}{1-3a^2}\right)$ (d) $\tan^{-1}\left(\frac{3a-a^3}{1-3a^2}\right)$

Answer:
(d)

62.

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

(a) -1 (b) $\frac{2}{5}$

(c) $\frac{1}{3}$ (d) $\frac{1}{5}$

Answer:
(d) 1/5

63.

If $x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$, then the value of $\tan^{-1}\left(\frac{\tan x}{4}\right) + \tan^{-1}\left(\frac{3\sin 2x}{5+3\cos 2x}\right)$ is

(a) $\frac{x}{2}$ (b) $2x$

(c) $3x$ (d) x

Answer:
(d) x

64.

$\cos[\tan^{-1}\{\sin(\cot^{-1} x)\}]$ is equal to

(a) $\sqrt{\frac{x^2+2}{x^3+3}}$ (b) $\sqrt{\frac{x^2+2}{x^2+1}}$

(c) $\sqrt{\frac{x^2+1}{x^2+2}}$ (d) None of these

Answer:
(c)

65.

If $\tan^{-1}\left(\frac{a}{x}\right) + \tan^{-1}\left(\frac{b}{x}\right) = \frac{\pi}{2}$, then x is equal to

(a) $\sqrt{ab}$ (b) $\sqrt{2ab}$

(c) $2ab$ (d) ab

Answer:
(a)

66.

If $\tan^{-1} x - \tan^{-1} y = \tan^{-1} A$, then A is equal to

(a) x – y

(b) x + y

(c) $x-y/1+xy$

(d) $x+y/1-xy$

Answer:

(c) $x-y/1+xy$

67.

If $\tan^{-1}\left(\frac{x-1}{x+2}\right)+\tan^{-1}\left(\frac{x+1}{x+2}\right)=\frac{\pi}{4}$, then x is equal to

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

(c) $\pm\sqrt{\frac{5}{2}}$ (d) $\pm\frac{1}{2}$

Answer:
(c)