

Tarun Classes of Mathematics

IIT-JEE Mains | CBSE | PU-CET | NDA

Talwara Township, Hoshiarpur | +91 9463672753 | tarunclasses.in

3D Geometry

Subjects : Maths

Previous Year Questions

Maths - Section A (MCQ.)

1. **Passage:** A line L passing through the point $(-1, 2, -3)$ is perpendicular to the plane P given by $2x + 3y + z + 5 = 0$.

Question: What is the equation of the line L ?

- A) $1 - x = y + 2 = 3 - z$ B) $-(x + 1) = y - 2 = z + 3$ C) $3x + 3 = 2y - 4 = 6z + 18$ D) $3x - 3 = 2y + 4 = 6z - 18$

2. **Passage:** The equation of the sphere S is $x^2 + y^2 + z^2 - 4x - 6y - 12z + k = 0$.

Question: If the radius of the sphere S is 8 units, what is the value of k ?

- A) -15 B) 7 C) 10 D) 15

3. **Passage:** $P(-2, -3, 5)$, $Q(4, -1, 5)$, $R(6, -4, 8)$ and $S(2, -6, 10)$ are four points.

Question: What is $(PQ^2 + 2QS^2 - 2PR^2)$ equal to ?

- A) -1 B) 0 C) 1 D) 2

4. **Passage:** A line L passing through the point $(-1, 2, -3)$ is perpendicular to the plane P given by $2x + 3y + z + 5 = 0$.

Question: What are the direction ratios of a line M parallel to the plane P ?

- A) $\langle -3, 2, 1 \rangle$ B) $\langle 3, 2, -6 \rangle$
C) $\langle 1, 3, 2 \rangle$ D) $\langle 2, 2, -10 \rangle$

5. **Paragraph:**

Let $2x^2 + 2y^2 + 2z^2 + 3x + 3y + 3z - 6 = 0$ be a sphere.

Question:

What is the diameter of the sphere?

- A) $\frac{5\sqrt{3}}{4}$ B) $\frac{5\sqrt{3}}{2}$ C) $\frac{3\sqrt{5}}{4}$ D) $\frac{3\sqrt{5}}{2}$

6. If p is the perpendicular distance from origin to the plane passing through $(1, 0, 0)$, $(0, 1, 0)$ and $(0, 0, 1)$, then what is $3p^2$ equal to?

- A) 4 B) 3 C) 2 D) 1

7. **Paragraph:**

Let $L : x + y + z + 4 = 0 = 2x - y - z + 8$ be a line and $P : x + 2y + 3z + 1 = 0$ be a plane

Question:

What is the point of intersection of L and P ?

- A) $(4, 3, -3)$ B) $(4, -3, 3)$ C) $(-4, -3, -3)$ D) $(-4, -3, 3)$

8. Paragraph:

Let $L : x + y + z + 4 = 0 = 2x - y - z + 8$ be a line and $P : x + 2y + 3z + 1 = 0$ be a plane

Question:

What are the direction ratios of the line?

- A) $\langle 2, 1, -1 \rangle$ B) $\langle 0, -1, 2 \rangle$ C) $\langle 0, 1, -1 \rangle$ D) $\langle 2, 3, -3 \rangle$

9. If a direction cosines $\langle l, m, n \rangle$ of a line are connected by relation $l + 2m + n = 0, 2l - 2m + 3n = 0$, then what is the value of $l^2 + m^2 - n^2$?

- A) $\frac{1}{101}$ B) $\frac{29}{101}$ C) $\frac{41}{101}$ D) $\frac{92}{101}$

10. If a vector of magnitude 2 units makes an angle $\frac{\pi}{3}$ with $2\hat{i}$, $\frac{\pi}{4}$ with $3\hat{j}$ and an acute angle θ with $4\hat{k}$, then what are the components of the vector?

- A) $(1, \sqrt{2}, 1)$ B) $(1, -\sqrt{2}, 1)$ C) $(1, -\sqrt{2}, -1)$ D) $(1, \sqrt{2}, -1)$

11. What is the equation of the sphere concentric with the sphere $x^2 + y^2 + z^2 - 2x - 6y - 8z - 5 = 0$ and which passes through the origin?

- A) $x^2 + y^2 + z^2 - 2x - 8z = 0$ B) $x^2 + y^2 + z^2 - 2x - 6y = 0$
C) $x^2 + y^2 + z^2 - 6y - 8z = 0$ D) $x^2 + y^2 + z^2 - 2x - 6y - 8z = 0$

12. Paragraph:

Let $A(1, -1, 2)$ and $B(2, 1, -1)$ be the end points of the diameter of the sphere $x^2 + y^2 + z^2 + 2ux + 2vy + 2wz - 1 = 0$

Question:

What is $u + v + w$ equal to?

- A) -2 B) -1 C) 1 D) 2

13. What is the angle between the lines $2x = 3y = -z$ and $6x = -y = -4z$?

- A) 0° B) 30° C) 60° D) 90°

14. A point P lies on the line joining $A(1, 2, 3)$ and $B(2, 10, 1)$. If z -coordinate of P is 7, what is the sum of other two coordinates?

- A) -15 B) -13 C) -11 D) -9

15. The plane $6x + ky + 3z - 12 = 0$ where meets the coordinate axes at A, B and C respectively. The equation of the sphere passing through the origin and A, B, C is $x^2 + y^2 + z^2 - 2x - 3y - 4z = 0$.

If p is the perpendicular distance from the centre of the sphere to the plane, then which one of the following is correct?

- A) $0 < p < 0.5$ B) $0.5 < p < 1$ C) $1 < p < 1.5$ D) $p > 1.5$

16. Let the plane $\frac{2x}{k} + \frac{2y}{3} + \frac{z}{3} = 2$ pass through the point $(2, 3, -6)$. What are the direction ratios of a normal to the plane?

- A) $\langle 3, 2, 1 \rangle$ B) $\langle 2, 3, 6 \rangle$
C) $\langle 6, 3, 2 \rangle$ D) $\langle 1, 2, 3 \rangle$

17. A plane cuts intercepts 2,2,1 on the coordinate axes. What are the direction cosines of the normal to the plane?

A) $\langle 2/3, 2/3, 1/3 \rangle$

B) $\langle 1/3, 2/3, 2/3 \rangle$

C) $\langle \frac{1}{\sqrt{6}}, \frac{1}{\sqrt{6}}, \frac{2}{\sqrt{6}} \rangle$

D) $\langle \frac{2}{\sqrt{6}}, \frac{1}{\sqrt{6}}, \frac{1}{\sqrt{6}} \rangle$

18. The foot of the perpendicular drawn from the origin to the plane $x + y + z = 3$ is

A) (0, 1, 2)

B) (0, 0, 3)

C) (1, 1, 1)

D) (-1, 1, 3)

19. The locus of a point $P(x, y, z)$ which moves in such a way that $z = 7$ is a

A) line parallel to x -axis

B) line parallel to y -axis

C) line parallel to z -axis

D) plane parallel to xy -plane

20. What is the angle between the two lines having direction ratios (6, 3, 6) and (3, 3, 0) ?

A) $\frac{\pi}{6}$

B) $\frac{\pi}{4}$

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

D) $\frac{\pi}{2}$

21. If l, m, n are the direction cosines of the line $x - 1 = 2(y + 3) = 1 - z$, then what is $l^4 + m^4 + n^4$ equal to?

A) 1

B) $\frac{11}{27}$

C) $\frac{13}{27}$

D) 4

22. A line through (1, -1, 2) with direction ratios $\langle 3, 2, 2 \rangle$ meets the plane $x + 2y + 3z = 18$. What is the point of intersection of line and plane?

A) (4, 4, 1)

B) (2, 4, 1)

C) (4, 1, 4)

D) (3, 4, 7)

23. Which one of the planes is parallel to the line $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$?

A) $2x + 2y + z - 1 = 0$

B) $2x - y - 2z + 5 = 0$

C) $2x + 2y - 2z + 1 = 0$

D) $x - 2y + z - 1 = 0$

24. Paragraph:

Let a vector $\vec{a} = 4\hat{i} - 8\hat{j} + \hat{k}$ make angles α, β, γ with the positive directions of x, y, z axes respectively.

Question:

What is $\cos 2\beta + \cos 2\gamma$ equal to?

A) $-\frac{32}{81}$

B) $-\frac{16}{81}$

C) $\frac{16}{81}$

D) $\frac{32}{81}$

25. The lengths of the intercepts on the co-ordinate axes made by the plane $5x + 2y + z - 13 = 0$ are

A) 5, 2, 1 unit

B) $\frac{13}{5}, \frac{13}{2}, 13$ unit

C) $\frac{5}{13}, \frac{2}{13}, \frac{1}{13}$ unit

D) 1, 2, 5 unit

26. What are the co-ordinates of the foot of the perpendicular drawn from the point (3, 5, 4) on the plane $z = 0$?

A) (0, 5, 4)

B) (3, 5, 0)

C) (3, 0, 4)

D) (0, 0, 4)

27. Under which one of the following conditions are the lines $x = ay + b; z = cy + d$ and $x = ey + f; z = gy + h$ perpendicular?

A) $ae + cg - 1 = 0$

B) $ae + bf - 1 = 0$

C) $ae + cg + 1 = 0$

D) $ag + ce + 1 = 0$

28. The line passing through the points (1, 2, -1) and (3, -1, 2) meets the yz -plane at which one of the following points?

A) $(0, -\frac{7}{2}, \frac{5}{2})$

B) $(0, \frac{7}{2}, \frac{1}{2})$

C) $(0, -\frac{7}{2}, -\frac{5}{2})$

D) $(0, -\frac{7}{2}, -\frac{5}{2})$

29. The equation of the plane passing through the line of intersection of the planes $x + y + z = 1, 2x + 3y + 4z = 7$, and perpendicular to the plane $x - 5y + 3z = 5$ is given by

- A)** $x + 2y + 3z - 6 = 0$ **B)** $x + 2y + 3z + 6 = 0$ **C)** $3x + 4y + 5z - 8 = 0$ **D)** $3x + 4y + 5z + 8 = 0$

30. What is the distance of the point $(2, 3, 4)$ from the plane $3x - 6y + 2z + 11 = 0$?

- A)** 1 unit **B)** 2 unit **C)** 3 unit **D)** 4 unit



Tarun Classes of Mathematics

IIT-JEE Mains | CBSE | PU-CET | NDA

Talwara Township, Hoshiarpur | +91 9463672753 | tarunklasses.in

3D Geometry

Subjects : Maths

Previous Year Questions

Maths - Section A (MCQ.)

1 - C	2 - A	3 - B	4 - D	5 - B	6 - D	7 - D	8 - C	9 - B	10 - A
11 - D	12 - A	13 - D	14 - A	15 - B	16 - A	17 - C	18 - C	19 - D	20 - B
21 - B	22 - C	23 - D	24 - A	25 - B	26 - B	27 - C	28 - D	29 - A	30 - A

