MATHS

BOOKS - OMEGA PUBLICATION

THREE DIMENSIONAL GEOMETRY

Questions

1. If a line has direction ratios $-18, 12, -4$, then what are its direction cosines ?

Watch Video Solution

2. Find the direction cosines of the sides of the triangle whose vertices are (3, 5, – 4), (– 1, 1, 2) and (– 5, – 5, – 2).

Watch Video Solution

3. A line passes through the point with position vector $2\hat{i} - \hat{j} + 4\hat{k}$ and is in the direction of $\hat{i} + \hat{j} + 2\hat{k}$. Find the equation of line in vector and in cartesian form.

Watch Video Solution

4. Show that the line through the points : (4,7,8), (2,3,4) is parallel to the line through the points (-1,-2,1) and (1,2,5).

Watch Video Solution

5. Find the cartesian equation of the line which passes through the point (– 2, 4, – 5) and parallel to the line given by $\frac{x+3}{3} = \frac{y-4}{5} = \frac{z+8}{6}$

Watch Video Solution

6. The vector equation of the line $\frac{x-5}{3} = \frac{y+4}{7} = \frac{z-6}{2}$ is .....

Watch Video Solution

7. Find the vector and the cartesian equations of the line that passes through the points (3, – 2, – 5), (3, – 2, 6).

Watch Video Solution

8. Find the angle between the pair of line

$$\vec{r} = 2\hat{i} - 5\hat{j} + \hat{k} + \lambda\left(3\hat{i} + 2\hat{j} + 6\hat{k}\right) \quad \text{and}$$

$$\vec{r} = 7\hat{i} - 6\hat{k} + \mu\left(\hat{i} + 2\hat{j} + 2\hat{k}\right).$$

Watch Video Solution

9. Find the angle between the pairs of lines

$$\vec{r} = 3\hat{i} + \hat{j} - 2\hat{k} + \lambda\left(\hat{i} - \hat{j} - 2\hat{k}\right)$$

$$\vec{r} = 2\hat{i} - \hat{j} - 56\hat{k} + \mu\left(3\hat{i} - 5\hat{j} - 4\hat{k}\right)$$

Watch Video Solution

10. Find the angle between the pair of lines

$$\frac{x+3}{3}=\frac{y-1}{5}=\frac{z+3}{4} \text{ and } \frac{x+1}{1}=\frac{y-4}{1}=\frac{z-5}{2}$$

Watch Video Solution

11. Find the angle between the pair of lines

$$\frac{x-2}{2}=\frac{y-1}{5}=\frac{z+3}{-3} \text{ and } \frac{x+2}{-1}=\frac{y-4}{8}=\frac{z-5}{4}$$

Watch Video Solution

12. Find the angle between the lines $\frac{x}{2} = \frac{y}{2} = \frac{z}{1}$ and $\frac{x-5}{4} = \frac{y-2}{1} = \frac{z-3}{8}$

Watch Video Solution

13. Find the angle between the lines $\frac{x+1}{2} = \frac{y}{3} = \frac{z-3}{6}$ and the planes $3x + y + z = 7$.

Watch Video Solution

14. The vector equation of two lines are $\vec{r} = \hat{i} + 2\hat{j} + \hat{k} + \lambda\left(\hat{i} - \hat{j} + \hat{k}\right)$ and $\vec{r} = 2\hat{i} - \hat{j} - \hat{k} + \mu\left(2\hat{i} + \hat{j} + 2\hat{k}\right)$. Find the shortest distance between these lines.

Watch Video Solution

15. Find the shortest distance between the lines whose vector equations are $\vec{r} = \hat{i} + 2\hat{j} + 3\hat{k} + \lambda\left(\hat{i} - 3\hat{j} + 2\hat{k}\right)$ and $\vec{r} = 4\hat{i} + 5\hat{j} + 6\hat{k} + \mu\left(2\hat{i} + 3\hat{j} + \hat{k}\right)$.

Watch Video Solution

16. Find the shortest distance between the following two lines

$$\vec{r} = (1+2\lambda)\hat{i} + (1-\lambda)\hat{j} + \lambda\hat{k}$$

$$\vec{r} = 2\hat{i} + \hat{j} - \hat{k} + \mu\left(3\hat{i} - 5\hat{j} + 2\hat{k}\right).$$

Watch Video Solution

17. The vector equation of two lines are

$$\vec{r} = (1-t)\hat{i} + (t-2)\hat{j} + (3-2t)\hat{k} \quad \text{and}$$

$$\vec{r} = (s+1)\hat{i} + (2s-1)\hat{j} - (2s-1)\hat{j} - (2s+1)\hat{k}$$

Find the shortest distance between these lines.

Watch Video Solution

Watch Video Solution

18. Find the equation of plane passing through (a,b,c) and parallel to the plane $\vec{r}.\left(\hat{i}+\hat{j}+\hat{k}\right)=2$

Watch Video Solution

19. In the following cases, find the co-ordinates of the foot of the perpendicular drawn from the origin : $x+y+z=1$

Watch Video Solution

20. In the following case, find the coordinates of the foot of the perpendicular drawn from the origin: $2x + 3y + 4z - 12 = 0$

Watch Video Solution

21. Find the length and the foot of the perpendicular from the point P(7,14,5) to the plane $2x + 4y - z = 2$. Also find the image of point P in the plane.

Watch Video Solution

22. Find the vector equation of the line passing through (1, 2, 3) and perpendicular to the plane $\vec{r} \cdot \left(\hat{i} + 2\hat{j} - 5\hat{k}\right) + 9 = 0$

Watch Video Solution

23. Find the shortest distance between the lines $\left(\frac{x+1}{7} = \frac{y+1}{-6} = \frac{z+1}{1}\right.$ and $\left.\frac{x-3}{1} = \frac{y-5}{-2} = \frac{z-7}{1}\right)$

Watch Video Solution

24. Find the co-ordinates of the points where the line through the points (3,-4,-5) and (2,-3,1) crosses the plane $2x + y + z = 7$

Watch Video Solution

25. Find the vector equation of the plane which is at a distance of 7 units from the origin and which is normal to the vector $3\hat{i} + 5\hat{j} - 6\hat{k}$.

Watch Video Solution

26. Find the cartesian equation of plane $\vec{r} \cdot \left(\hat{i} + \hat{j} - \hat{k}\right) = 2$

Watch Video Solution

27. Find the co-ordinates of the foot of the perpendicular drawn from the origin to the plane $5y + 8 = 0.$

Watch Video Solution

28. Find the equations of the plane that passes through three points : (1,1,-1), (6,4,-5), (-4,-2,3)

Watch Video Solution

29. Find the equation of the plane passing through the point (1, -1 , 2) and perpendicular to the planes $2x + 3y - 2z = 5$ and $x + 2y - 3z = 8$.

Watch Video Solution

30. Find the intercepts cut off by the plane $2x + y - z = 5$

Watch Video Solution

31. Find the vector equation of the plane through the intersection of the planes $\vec{r} \cdot \left(\hat{i} + \hat{j} + \hat{k}\right) = 6$ and $\vec{r} \cdot \left(2\hat{i} + 3\hat{j} + 4\hat{k}\right) = -5$ and the point (1,1,1).

Watch Video Solution

32. Find the vector equation of plane passing through the intersection of the planes $\vec{r} \cdot \left(2\hat{i} + 2\hat{j} - 3\hat{k}\right) = 7$ and $\vec{r} \cdot \left(2\hat{i} + 5\hat{j} + 3\hat{k}\right) = 9$ and through the point (2,1,3).

Watch Video Solution

33. Find the equation of the plane through the intersection of the planes $3x - y + 2z - 4 = 0$ and $x + y + z - 2 = 0$ and the point (2, 2, 1).I

Watch Video Solution

34. Find the equation of the plane passing through the line of intersection of the planes $2x + y - z = 3$ and $5x - 3y + 4z + 9 = 0$ and parallel to the line $\frac{x-1}{2} = \frac{y-3}{4} = \frac{5-z}{-5}$

Watch Video Solution

35. Find the angle between the planes whose vector equations are

$\vec{r}\left(2\hat{i} + 2\hat{j} - 3\hat{k}\right) = 5$ and $\vec{r} \cdot \left(3\hat{i} - 3\hat{j} + 5\hat{k}\right) = 3.$

Watch Video Solution

Watch Video Solution

36. Find the vector equation of plane that passes through the point (1,0,-2) and the normal to the plane is $\hat{i} + \hat{j} - \hat{k}$.

Watch Video Solution

37. If a line has direction ratios $-18, 12, -4$, then what are its direction cosines ?

Watch Video Solution

38. Find the direction cosines of the sides of the triangle whose vertices are (3, 5, – 4), (– 1, 1, 2) and (– 5, – 5, – 2).

Watch Video Solution

39. A line passes through the point with position vector $2\hat{i} - \hat{j} + 4\hat{k}$ and is in the direction of $\hat{i} + \hat{j} + 2\hat{k}$. Find the equation of line in vector and in cartesian form.

Watch Video Solution

40. Show that the line through the points : (4,7,8), (2,3,4) is parallel to the line through the points (-1,-2,1) and (1,2,5).

Watch Video Solution

41. Find the cartesian equation of the line which passes through the point (– 2, 4, – 5) and parallel to the line given by $\frac{x+3}{3} = \frac{y-4}{5} = \frac{z+8}{6}$

Watch Video Solution

42. The vector equation of the line $\frac{x-5}{3} = \frac{y+4}{7} = \frac{z-6}{2}$ is .....

Watch Video Solution

43. Find the vector and the cartesian equations of the line that passes through the points (3, – 2, – 5), (3, – 2, 6).

Watch Video Solution

44. Find the angle between the pair of lines

$$\vec{r} = 2\hat{i} - 5\hat{j} + \hat{k} + \lambda\left(3\hat{i} + 2\hat{j} + 6\hat{k}\right) \quad \text{and}$$

$$\vec{r} = 7\hat{i} - 6\hat{k} + \hat{h}\left(\hat{i} + 2\hat{j} + 2\hat{k}\right)$$

Watch Video Solution

45. Find the angle between the pairs of lines

$$\vec{r} = 3\hat{i} + \hat{j} - 2\hat{k} + \lambda\left(\hat{i} - \hat{j} - 2\hat{k}\right)$$

$$\vec{r} = 2\hat{i} - \hat{j} - 56\hat{k} + \mu\left(3\hat{i} - 5\hat{j} - 4\hat{k}\right)$$

Watch Video Solution

46. Find the angle between the pair of lines $\frac{x+3}{3}=\frac{y-1}{5}=\frac{z+3}{4}$ and $\frac{x+1}{1}=\frac{y-4}{1}=\frac{z-5}{2}$

Watch Video Solution

47. Find the angle between the pair of lines $\frac{x-2}{2}=\frac{y-1}{5}=\frac{z+3}{-3}$ and $\frac{x+2}{-1}=\frac{y-4}{8}=\frac{z-5}{4}$

Watch Video Solution

48. Find the angle between the lines $\frac{x}{2} = \frac{y}{2} = \frac{z}{1}$ and $\frac{x-5}{4} = \frac{y-2}{1} = \frac{z-3}{8}$

Watch Video Solution

49. Find the angle between the line $\frac{x+1}{2} = \frac{y}{3} = \frac{z-3}{6}$ and the plane $10x + 2y - 11z = 3$

Watch Video Solution

50. The vector equation of two lines are $\vec{r} = \hat{i} + 2\hat{j} + \hat{k} + \lambda\left(\hat{i} - \hat{j} + \hat{k}\right)$ and $\vec{r} = 2\hat{i} - \hat{j} - \hat{k} + \mu\left(2\hat{i} + \hat{j} + 2\hat{k}\right)$. Find the shortest distance between these lines.

Watch Video Solution

51. Find the shortest distance between the lines whose vector equations are $\vec{r} = \hat{i} + 2\hat{j} + 3\hat{k} + \lambda\left(\hat{i} - 3\hat{j} + 2\hat{k}\right)$ and $\vec{r} = 4\hat{i} + 5\hat{j} + 6\hat{k} + \mu\left(2\hat{i} + 3\hat{j} + \hat{k}\right)$.

Watch Video Solution

52. Find the shortest distance between the following two lines

$$\vec{r} = (1+2\lambda)\hat{i} + (1-\lambda)\hat{j} + \lambda\hat{k}$$

$$\vec{r} = 2\hat{i} + \hat{j} - \hat{k} + \mu\left(3\hat{i} - 5\hat{j} + 2\hat{k}\right).$$

Watch Video Solution

53. The vector equation of two lines are

$$\vec{r} = (1-t)\hat{i} + (t-2)\hat{j} + (3-2t)\hat{k}$$ and

$$\vec{r} = (s+1)\hat{i} + (2s-1)\hat{j} - (2s-1)\hat{j} - (2s+1)\hat{k}$$

Find the shortest distance between these lines.

Watch Video Solution

Watch Video Solution

54. Find the equation of plane passing through (a,b,c) and parallel to the plane $\vec{r}.\left(\hat{i}+\hat{j}+\hat{k}\right)=2$

Watch Video Solution

55. In the following cases, find the co-ordinates of the foot of the perpendicular drawn from the origin : $x+y+z=1$

Watch Video Solution

56. Find the co-ordinates of the foot of perpendicular drawn from the origin to $2x + 3y + 4z - 12 = 0$.

View Text Solution

57. Find the length and the foot of the perpendicular from the point $(7, 14, 5)$ to the plane $2x + 4y - z = 2$.

Watch Video Solution

58. Find vector equation of line passing through (1,2,3) and perpendicular to plane

$r.\left(\hat{i}+2\hat{j}-5\hat{k}\right)+9=0$

View Text Solution

59. Find the shortest distance between the lines

$$\frac{x+1}{7}=\frac{y+1}{-6}=\frac{z+1}{1}$$

and

$$\frac{x-1}{1}=\frac{y-5}{-2}=\frac{z-7}{1}$$

View Text Solution

60. Find the co-ordinates of the points where the line through the points (3,-4,-5) and (2,-3,1) crosses the plane $2x + y + z = 7$

Watch Video Solution

61. Find the vector equation of the plane which is at a distance of 7 units from the origin and which is normal to the vector $3\hat{i} + 5\hat{j} - 6\hat{k}$.

Watch Video Solution

62. Find the cartesian equation of plane $\vec{r} \cdot \left(\hat{i} + \hat{j} - \hat{k}\right) = 2$

Watch Video Solution

63. Find the co-ordinates of the foot of the perpendicular drawn from the origin to the plane $5y + 8 = 0$.

Watch Video Solution

64. Find the equations of the plane that passes through three points : (1,1,-1), (6,4,-5), (-4,-2,3)

Watch Video Solution

65. Find the equation of the plane passing through the point (1, -1 , 2) and perpendicular to the planes $2x + 3y - 2z = 5$ and $x + 2y - 3z = 8$.

Watch Video Solution

66. Find the intercepts cut off by the plane $2x + y - z = 5$

Watch Video Solution

67. Find the vector equation of the plane through the intersection of the planes $\vec{r} \cdot \left(\hat{i} + \hat{j} + \hat{k}\right) = 6$ and $\vec{r} \cdot \left(2\hat{i} + 3\hat{j} + 4\hat{k}\right) = -5$ and the point (1,1,1).

Watch Video Solution

68. Find the equation of the plane through the intersection of the planes $\vec{r} \cdot \left(2\hat{i} + \hat{j} + 3\hat{k}\right) = 7$ and $\vec{r} \cdot \left(2\hat{i} + 3\hat{j} + 3\hat{k}\right) = 9$ and passing through the point (2,1,3).

Watch Video Solution

69. Find the equation of the plane through the intersection of the planes $3x - y + 2z - 4 = 0$ and $x + y + z - 2 = 0$ and the point (2, 2, 1).I

Watch Video Solution

70. Find the equation of the plane passing through the line of intersection of the planes $2x + y - z = 3$ and $5x - 3y + 4z = 9$ and parallel to the lines $\frac{x-1}{2} = \frac{y-3}{4} = \frac{z-5}{5}$

Watch Video Solution

71. Find the angle between the planes whose vector equations are

$\vec{r}\left(2\hat{i} + 2\hat{j} - 3\hat{k}\right) = 5$ and $\vec{r} \cdot \left(3\hat{i} - 3\hat{j} + 5\hat{k}\right) = 3.$

Watch Video Solution

Watch Video Solution

72. Find the vector equation of plane that passes through the point (1,0,-2) and the normal to the plane is $\hat{i} + \hat{j} - \hat{k}$.

Watch Video Solution

Important Questions From Miscellaneous Exercise

1. If the lines $\frac{x-1}{-3} = \frac{y-2}{2k} = \frac{z-3}{2}$ and $\frac{x-1}{3k} = \frac{y-1}{1} = \frac{z-6}{-5}$ are perpendicular, find the value of k.

Watch Video Solution

2. A line makes angle $\alpha, \beta, \gamma, \delta$ with the four diagonals of a cube, prove that $\cos^2\alpha + \cos^2\beta + \cos^2\gamma + \cos^2\delta = \frac{4}{3}$.

Watch Video Solution

3. Find the distance of the point $(-1, -5, -10)$ from the point of intersection of the line $\vec{r} = 2\hat{i} - \hat{j} + 2\hat{k} + \lambda\left(3\hat{i} + 4\hat{j} + 2\hat{k}\right)$ and the plane $\vec{r} \cdot \left(\hat{i} - \hat{j} + \hat{k}\right) = 5$

Watch Video Solution

4. The distance of the point $P(-2, 3, -4)$ from the line $\frac{x+2}{3} = \frac{2y+3}{4} = \frac{3z+4}{5}$ measured parallel to the plane $4x + 12y - 3z + 1 = 0$ is d, then find the value of $(2d - 8)$, is.....

Watch Video Solution

5. Find the equation of the plane passing through the point (-1, 3, 2) and perpendicular to each of

the planes : $x + 2y + 3z = 5$ and $3x + 3y + z = 0$.

Watch Video Solution

6. Find the vector equation of the line passing through (1,2,3) and parallel to the planes $\vec{r} \cdot \left(\hat{i} - \hat{j} + 2\hat{k}\right) = 5$ and $\vec{r} \cdot \left(3\hat{i} + \hat{j} + \hat{k}\right) = 6$.

Watch Video Solution

7. Find the equation of the line passing through the point P(4,6,2) and the point of intersection of the line $\frac{x-1}{3}=\frac{y}{2}=\frac{z+1}{7}$ and the plane $x+y-z=8$.

Watch Video Solution

8. If l_1, m_1, n_1 and l_2, m_2, n_2 are the direction cosines of two mutualy perpendicular lines, who that the direction cosines of the line perpendicular to both of these are

$< m_1n_2 - m_2n_1, n_1l_2 - n_2l_1, l_1m_2 - l_2m_1 >$

Watch Video Solution

9. If the equation of line AB is $\frac{x-3}{1}=\frac{y+2}{-2}=\frac{z-5}{4}$, find the direction of a line parallel to AB.

Watch Video Solution

10. Find the equation of the plane determined by the points A(3,-1,2),B(5,2,4) and C(-1,-1,6). Also find the distance of the point P(6,5,9) from the plane.

Watch Video Solution

11. Find the equation of the plane through the intersection of the planes $x + y + z = 1$ and $2x + 3y + 4z = 5$ which is perpendicular to the plane $x - y + z = 0$

Watch Video Solution

12. Prove that if a plane has intercepts a,b,c and is at a distance of p units from the origin, then $\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2} = \frac{1}{p^2}$.

Watch Video Solution

13. If the lines $\frac{x-1}{-3}=\frac{y-2}{2k}=\frac{z-3}{2}$ and $\frac{x-1}{3k}=\frac{y-1}{1}=\frac{z-6}{-5}$ are perpendicular, find the value of k.

Watch Video Solution

14. A line makes angles $\alpha, \beta, \gamma, \delta$ with the diagonals of a cube, prove that $\cos^2\alpha+\cos^2\beta+\cos^2\gamma+\cos^2\delta=\frac{4}{3}$

Watch Video Solution

15. Find the distance of the point $(-1, -5, -10)$ from the point of intersection of the line $\vec{r} = 2\hat{i} - \hat{j} + 2\hat{k} + \lambda\left(3\hat{i} + 4\hat{j} + 2\hat{k}\right)$ and the plane $\vec{r} \cdot \left(\hat{i} - \hat{j} + \hat{k}\right) = 5$

Watch Video Solution

16. The distance of the point $P(-2, 3, -4)$ from the line $\frac{x+2}{3} = \frac{2y+3}{4} = \frac{3z+4}{5}$ measured parallel to the plane $4x + 12y - 3z + 1 = 0$ is d, then find the value of $(2d - 8)$, is.....

Watch Video Solution

17. Find the equation of the planes passing through the point $(-1, 3, 2)$ and perpendicular to each of the planes $x + 2y + 3z = 5$ and $3x + 8y + z = 0$.

Watch Video Solution

18. Find the vector equation of the line passing through (1,2,3) and parallel to the planes $\vec{r} \cdot \left(\hat{i} - \hat{j} + 2\hat{k}\right) = 5$ and $\vec{r} \cdot \left(3\hat{i} + \hat{j} + \hat{k}\right) = 6$.

Watch Video Solution

19. Find the equation of the line passing through the point P(4,6,2) and the point of intersection of the line $\frac{x-1}{3}=\frac{y}{2}=\frac{z+1}{7}$ and the plane $x+y-z=8$.

Watch Video Solution

20. If l_1, m_1, n_1 and l_2, m_2, n_2 are the direction cosines of two mutualy perpendicular lines, who that the direction cosines of the line

perpendicular to both of these are

$< m_1n_2 - m_2n_1, n_1l_2 - n_2l_1, l_1m_2 - l_2m_1 >$

Watch Video Solution

21. If the equation of line AB is $\frac{x-3}{1} = \frac{y+2}{-2} = \frac{z-5}{4}$, find the direction of a line parallel to AB.

Watch Video Solution

22. Find the equation of the plane determined by the points A(3,-1,2), B(5,2,4) and C(-1,-1,6) and hence

find the distance between the plane and the point P(6,5,9).

Watch Video Solution

23. Find the equation of the plane through the intersection of the planes $x + y + z = 1$ and $2x + 3y + 4z = 5$ which is perpendicular to the plane $x - y + z = 0$

Watch Video Solution

24. Prove that if a plane has intercepts a,b,c and is at a distance of p units from the origin, then $\frac{1}{a^2}+\frac{1}{b^2}+\frac{1}{c^2}=\frac{1}{p^2}$.

Watch Video Solution

Multiple Choice Questions Mcqs

1. Distance between the two planes: $2x+3y+4z=4$ and $4x+6y+8z=12$ is:

A. 2 units

B. 4 units

C. 8 units

D. $\frac{2}{\sqrt{29}}$ units

Answer: D

Watch Video Solution

2. The planes $2x - y + 4z = 5$ and $5x - 2.5y + 10z = 6$ are :

A. perpendicular

B. parallel

C. intersect y-axis

D. passes through $\left(0, 0, \frac{5}{4}\right)$

Answer: B

Watch Video Solution

3. Two lines which do not lie in the same plane are called

A. parallel

B. coincident

C. Interescting

D. Skew

Answer: D

Watch Video Solution

4. If a line makes angles α, β, γ respectively, positive x-axis, y-axis and z-axis, $\cos^2\alpha + \cos^2\beta + \cos^2\gamma = ?$

A. 2

B. 1

C. 0

D. none of these

Answer: B

Watch Video Solution

5. The equation $x^2 + y^2 = 0$ in three dimension space represents

A. a point

B. empty set

C. z-axis

D. none of these

Answer: C

Watch Video Solution

6. If $\cos\alpha, \cos\beta, \cos\gamma$ are the direction-cosines of a line, then the value of $\sin^2\alpha + \sin^2\beta + \sin^2\gamma =$

A. 1

B. 2

C. 3

D. -1

Answer: B

Watch Video Solution

7. The planes $2x - 2y + 4z + 5 = 0$ and $3x - 3y + 6z - 1 = 0$ are

A. parallel

B. perpendicular

C. Intersecting

D. None of these

Answer: A

Watch Video Solution

8. The planes $2x + y + 3z - 2 = 0$ and $x - 2y + 5 = 0$ are

A. parallel

B. perpendicular

C. intersecting

D. none of these

Answer: B

Watch Video Solution

9. In the following determine whether the given planes are parallel or perpendicular and in case they are neither, find the angles between them:

$2x - y + 3z - 1 = 0$ and $2x - y + 3z + 3 = 0$

A. parallel

B. perpendicular

C. intersecting

D. None of these

Answer: A

Watch Video Solution

10. If a line makes angles $90^\circ, 60^\circ$ and 30° with the positive direction of x,y and z-axis reapectively, then direction cosines are

A. $\left(0, \frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

B. $\left(\frac{1}{2}, 0, \frac{\sqrt{3}}{2}\right)$

C. $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}, 0\right)$

D. None of these

Answer: A

Watch Video Solution

11. The angle between the two diagonals of cube is

A. 30°

B. 45°

C. 60°

D. None of these

Answer: D

Watch Video Solution

12. The angle between the tines $\frac{x-5}{2}=\frac{y+1}{2}=\frac{z-6}{-6}$ and $\frac{x-5}{3}=\frac{y+4}{-4}=\frac{z+1}{12}$ is

A. $\cos^{-1}\left(\frac{-14}{39}\right)$

B. $\cos^{-1}\left(\frac{14}{39}\right)$

C. $\sin^{-1}\left(\frac{14}{39}\right)$

D. None of these

Answer: D

Watch Video Solution

13. If a line makes angle $90^\circ, 135^\circ, 45^\circ$ with X,Y and Z-axis respectively, then its direction cosines are

A. $(0, 0, 0)$

B. $\left(0, \frac{-1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$

C. $\left(\frac{1}{\sqrt{2}}, \frac{-1}{\sqrt{2}}, 0\right)$

D. $\left(-\frac{1}{\sqrt{2}}, 0, \frac{1}{\sqrt{2}}\right)$

Answer: B

Watch Video Solution

14. If a line passing through two points (-2,4,-5) and (1,2,3) then its direction cosines will be :

A. $\left(\frac{3}{\sqrt{77}}, \frac{-2}{\sqrt{77}}, \frac{8}{\sqrt{77}}\right)$

B. $\left(\frac{-2}{\sqrt{77}}, \frac{3}{\sqrt{77}}, \frac{8}{\sqrt{77}}\right)$

C. $\left(\frac{3}{\sqrt{77}}, \frac{+2}{\sqrt{77}}, \frac{8}{\sqrt{77}}\right)$

D. $\left(-\frac{1}{\sqrt{2}}, 0, \frac{1}{\sqrt{2}}\right)$

Answer: A

Watch Video Solution

15. Direction casines of z-axis are

A. $(0, 0, 1)$

B. $(1, 0, 0)$

C. $(0, 0, 0)$

D. $(0, 1, 0)$

Answer: A

Watch Video Solution

16. If a line has direction ratios $(2, -1, -2)$, then its drection cosines are

A. $\left(\frac{2}{3}, -\frac{1}{3}, \frac{-2}{3}\right)$

B. $\left(-\frac{2}{3}, -\frac{1}{2}, \frac{2}{3}\right)$

C. $\left(-\frac{2}{3}, -\frac{1}{3}, \frac{-2}{3}\right)$

D. None of these

Answer: A

Watch Video Solution

17. Distance between the two planes: $2x + 3y + 4z = 4$ and $4x + 6y + 8z = 12$ is:

A. 2 units

B. 4 units

C. 8 units

D. $\frac{2}{\sqrt{29}}$ units

Answer: D

Watch Video Solution

18. The planes $2x - y + 4z = 5$ and $5x - 2.5y + 10z = 6$ are :

A. perpendicular

B. parallel

C. intersect y-axis

D. passes through $\left(0, 0, \frac{5}{4}\right)$

Answer: B

Watch Video Solution

19. Two lines which do not lie in the same plane are called

A. parallel

B. coincident

C. Interescting

D. Skew

Answer: D

Watch Video Solution

20. If a line makes angles α, β, γ respectively, positive x-axis, y-axis and z-axis, $\cos^2\alpha + \cos^2\beta + \cos^2\gamma = ?$

A. 2

B. 1

C. 0

D. none of these

Answer: B

Watch Video Solution

21. The equation $x^2 + y^2 = 0$ in three dimension space represents

A. a point

B. empty set

C. z-axis

D. none of these

Answer: C

 Watch Video Solution

22. If $\cos\alpha, \cos\beta, \cos\gamma$ are the direction-cosines of a line, then the value of $\sin^2\alpha + \sin^2\beta + \sin^2\gamma =$

A. 1

B. 2

C. 3

D. -1

Answer: B

Watch Video Solution

23. The planes $2x - 2y + 4z + 5 = 0$ and $3x - 3y + 6z - 1 = 0$ are

A. parallel

B. perpendicular

C. Intersecting

D. None of these

Answer: A

Watch Video Solution

24. The planes $2x + y + 3z - 2 = 0$ and $x - 2y + 5 = 0$ are

A. parallel

B. perpendicular

C. intersecting

D. none of these

Answer: B

Watch Video Solution

25. The planes $2x - y + 3z - 1 = 0$ and $2x - y + 3z + 3 = 0$ are

A. parallel

B. perpendicular

C. intersecting

D. None of these

Answer: A

Watch Video Solution

26. If a line makes angles $90^\circ, 60^\circ$ and 30° with the positive direction of x,y and z-axis reapectively, then direction cosines are

A. $\left(0, \frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

B. $\left(\frac{1}{2}, 0, \frac{\sqrt{3}}{2}\right)$

C. $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}, 0\right)$

D. None of these

Answer: A

Watch Video Solution

27. The angle between the two diagonals of cube is

A. 30°

B. 45°

C. 60°

D. None of these

Answer: D

Watch Video Solution

28. The angle between the tines $\frac{x-5}{2}=\frac{y+1}{2}=\frac{z-6}{-6}$ and $\frac{x-5}{3}=\frac{y+4}{-4}=\frac{z+1}{12}$ is

A. $\cos^{-1}\left(\frac{-14}{39}\right)$

B. $\cos^{-1}\left(\frac{14}{39}\right)$

C. $\sin^{-1}\left(\frac{14}{39}\right)$

D. None of these

Answer: D

Watch Video Solution

29. If a line makes angle $90^\circ, 135^\circ, 45^\circ$ with X,Y and Z-axis respectively, then its direction cosines are

A. $(0, 0, 0)$

B. $\left(0, \frac{-1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$

C. $\left(\frac{1}{\sqrt{2}}, \frac{-1}{\sqrt{2}}, 0\right)$

D. $\left(-\frac{1}{\sqrt{2}}, 0, \frac{1}{\sqrt{2}}\right)$

Answer: B

Watch Video Solution

30. If a line passing through two points (-2,4,-5) and (1,2,3) then its direction cosines will be :

A. $\left(\frac{3}{\sqrt{77}}, \frac{-2}{\sqrt{77}}, \frac{8}{\sqrt{77}}\right)$

B. $\left(\frac{-2}{\sqrt{77}}, \frac{3}{\sqrt{77}}, \frac{8}{\sqrt{77}}\right)$

C. $\left(\frac{3}{\sqrt{77}}, \frac{+2}{\sqrt{77}}, \frac{8}{\sqrt{77}}\right)$

D. $\left(-\frac{1}{\sqrt{2}}, 0, \frac{1}{\sqrt{2}}\right)$

Answer: A

Watch Video Solution

31. Direction casines of z-axis are

A. $(0, 0, 1)$

B. $(1, 0, 0)$

C. $(0, 0, 0)$

D. $(0, 1, 0)$

Answer: A

Watch Video Solution

32. If a line has direction ratios $(2, -1, -2)$, then its drection cosines are

A. $\left(\frac{2}{3}, -\frac{1}{3}, \frac{-2}{3}\right)$

B. $\left(-\frac{2}{3}, -\frac{1}{2}, \frac{2}{3}\right)$

C. $\left(-\frac{2}{3}, -\frac{1}{3}, \frac{-2}{3}\right)$

D. None of these

Answer: A

Watch Video Solution