MATHS

BOOKS - MAHAVEER PUBLICATION

CO-ORDINATE GEOMETRY OF THREE DIMENSIONS

Question Bank

1. Name the octant wherein the given points lies: (1,2,3)

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2. Name the octant wherein the given points lies: (-2,-1,4)

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3. Name the octant wherein the given points lies: (2,-5,1)

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4. Name the octant wherein the given points lies: (-1,-3,-2)

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5. Find the distance between the points (2,-4,1) and (1,3,-1)

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6. Find the value of x if the distance between the points (7,1,x) and (4,5,9) is 13.

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7. Find the co-ordinates of the point which divides the line joining the points (2,-4,3) and (-4,5,-6) in the ratio 2:1

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8. Find the ratio in which the line segment joining the points (3,5,7) and (-2,4,6) is divided by YZ plane

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9. Find the direction ratios of the line joining the points (1,1,-3) and (-2,-3,2)

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10. Find the direction cosines of the line joining the points (1,1,-3) and (-2,-3,2)

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11. Find the projections (feet of the perpendiculars) of the point(1,-2,4) on the Co-ordinate planes

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12. Find the projections (feet of the perpendiculars) of the point(1,-2,4) on the Co-ordinate axes

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13. Find the projection of the line segment joining the points (3,3,5) and (5,4,3) on the line joining the points (2,-1,4) and (0,1,5)

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14. If the co-ordinates of the point p are (1,2,2), what are the direction cosines of OP. (Here O is origin).

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15. A line makes 45° and 60° with y and z axes respectively. What angle does it make with the x axis?

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16. Can the direction cosines of a line be $\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}$?

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17. If OP=3 and the direction ratios of OP be 4,2 and 4 then find the co-ordinates of p.

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18. If $\cos\alpha, \cos\beta, \cos\gamma$ be the direction cosines of a line, prove that

$\sin^2\alpha + \sin^2\beta + \sin^2\gamma = 2.$

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19. Find the direction cosines of a line which makes equal angles with the coordinate axes.

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20. For what value 'a' will the number $\sqrt{\frac{1}{2}}, a, \sqrt{\frac{1}{3}}$ be the direction cosines of a line?

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21. The angle between the planes 2x-y+3z=6 and x+y+2z=7 is

A. 0°

B. 30°

C. 45°

D. 60°

Answer: D

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22. A line joining the points (1,1,1) and (2,2,2) intersect the plane x+y+z=9 at the point

A. (3,4,2)

B. (2,3,4)

C. (3,2,4)

D. (3,3,3)

Answer: D

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23. Find the image of point (3,-2,1) in the plane $3x - y + 4z = 2$.

A. (0,1,3)

B. (0,-1,-3)

C. (0,-1,3)

D. (0,1,-3)

Answer: B

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24. Let L be the line of intersection of the planes $2x + 3y + z = 1$ and $x + 3y + 2z = 2$. If L makes an angles $\alpha$with the positive x-axis, then cosα equals $\frac{1}{\sqrt{3}}$ $\frac{1}{2}$ 1 $\frac{1}{\sqrt{2}}$

A. 1

B. $\frac{1}{\sqrt{2}}$

C. $\frac{1}{\sqrt{3}}$

D. $\frac{1}{2}$

Answer: C

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25. The ratio in which the line joining (2,4,5) and (3,5,-4) is divided by the yz-plane is

A. 2:3

B. 3:2

C. -2:3

D. 4:(-3)

Answer: C

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26. The distance of the point (2,1,-1) from the plane $x - 2y + 4z = 9$ is (A) $\frac{\sqrt{13}}{21}$ (B) $\frac{13}{21}$ (C) $\frac{13}{\sqrt{21}}$ (D) $\sqrt{\frac{13}{21}}$

A. $\frac{\sqrt{13}}{21}$

B. $\frac{13}{12}$

C. $\frac{13}{\sqrt{21}}$

D. $\sqrt{\frac{13}{21}}$

Answer: C

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27. The line $\frac{x+1}{1} = \frac{y-1}{2} = \frac{z-1}{0}$

A. is perpendicular to z-axis

B. is parallel to z-axis

C. lies in xy-plane

D. None of these

Answer: A

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28. Equation of the line passing through (1,1,1) and perpendicular to the plane 2x+3y-z-5=0 is

A. $\frac{x-1}{2}=\frac{y-1}{3}=\frac{z-1}{1}$

B. $\frac{x-1}{2}=\frac{y-1}{3}=\frac{z-1}{-1}$

C. $\frac{x-1}{2}=\frac{y-1}{-1}=\frac{z-1}{1}$

D. None of the above

Answer: B

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29. Find the distance of the following points from the origin (0,-4,4)

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30. Find the distance of the following points from the origin (2,4,-3)

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31. Find the distance of the following points from the origin (4,-5,3)

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32. What is the distance of the y-axis from the point(3,-4,0)?

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33. Find the distances between the following pair of points. (4,3,-6) and (-2,1,-3)

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34. Find the distances between the following pair of points. (-4,-2,3) and (3,3,5)

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35. If the distance between the points (x,2,0) and (1,3,1) be $\sqrt{6}$, find the value of x.

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36. Show that the points (1,-2,-3),(2,-3,-1) and (3,-1,-2) are the vertices of an equilateral triangle

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37. Show that the triangle with vertices (6,10,10),(1,0,-5) and (6,-10,0) is a right angled triangle

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38. Find the locus of the point which is equidistant from the points (1,-2,3) and (-3,4,2).

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39. The distance of a point from the x-axis is twice its distance from the point (1,2,-1). Find the locus of the point.

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40. A point moves in such a way that its distance from the X-axis is twice its distance from the Y-axis. Find the locus of the point.

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41. Find the co-ordinates of the point which divides the join of (5,8,-3) and (1,0,-3) in the radio 3:1.

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42. In what ratio does the origin divides the line segment joining the points P(-1,-2,-3) and Q(4,8,12).

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43. Find the co-ordinates of the centroid of the triangle whose vertices are (3,1,4),(-2,5,3) and (4,-5,3)

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44. Find the point of intersection of the medians of the triangle whose vertices are (-1,-3,-4),(4,-2,-7) and (2,3,-8).

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45. Find the lengths of the medians of the triangle whose vertices are A(2,-3,1),B(-6,5,3) and C(8,7,-7).

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46. Can there be any line which makes angles $30^\circ, 45^\circ$ and 60° with the co-ordinate axes?

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47. If a line makes angles 60° and 135° respectively with x and y axes find the value of $\cos\gamma$, where γ is the angle made the line with the z axis.

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48. If a line makes angles α, β and γ with the co-ordinate axes, find $\cos\beta$, if $\cos\alpha = \frac{14}{15}$ and $\cos\gamma = -\frac{1}{3}$.

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49. Find the direction cosines of the line whose direction ratio are 2,-4,6

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50. Find the direction cosines of the line whose direction ratio are $\sqrt{3}, 0, -1$

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51. Find the direction cosines of the line whose direction ratio are a-b,b-c,c-a

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52. If a line make angle 30° and 60° with the x and y axes, what angles does it make with the z axes?

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53. Find the direction ratios and direction cosines of the lines joining the following points.(1,2,3) and (4,5,6)

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54. Find the direction ratios and direction cosines of the lines joining the following points. (5,3,-2) and (3,-1,4)

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55. Find the angle between the following pair of lines whose direction ratios are given 1,2,3 and 2,-4,4

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56. Find the angle between the following pair of lines whose direction ratios are given -1,2,1and 2,3,-1

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57. Show that the line joining the points (1,2,3) and (4,5,7) is parallel to the line joining the points (-4,3,-6) and (2,9,2).

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58. For what value of x will the line joining the points (x,6,-3),(5,3,2)will be perpendicular to the joining the points (2,5,1),(-6,2,6)?

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59. A (6,3,2),B(4,1,4),C(3,-4,7) and D(0,2,5) are four given points. Find the projection of AB on CD and projection of CD on AB.

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60. For that value of a will be the numbers $\frac{1}{\sqrt{2}}, a, \frac{1}{\sqrt{3}}$ be the direction cosines of a line?

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