



MATHS

BOOKS - MBD MATHS (ODIA ENGLISH)

INTRODUCTION TO THREE DIMENSIONAL GEOMETRY

Question Bank

1. Fill in the blanks in the distance of the point

$P(x_0, y_0, z_0)$ from z axis is :

$$\left[\sqrt{x_0^2 + y_0^2}, \sqrt{y_0^2 + z_0^2}, \sqrt{x_0^2 + z_0^2}, \sqrt{(x - x_0)^2 + (y - y_0)^2} \right]$$



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2. Fill in the blanks in the length of the projection of the line segment joining (1,3,-1) and (3,2,4) on z-axis is _____.

[1, 3, 4, 5]



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3. The image of the point $(6,3,-4)$ with respect to yz -plane is _____.

$$\begin{bmatrix} 6 & 0 & -4 \\ 6 & -3 & 4 \\ -6 & -3 & -4 \\ -6 & 3 & -4 \end{bmatrix}$$



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4. If the distance between the points $(-1,-1,z)$ and $(1,-1,1)$ is 2 "then" $z =$ _____. $[1, \sqrt{2}, 2, 0]$



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5. Identify the axes on which the given points lie:

$(1, 0, 0)$, $(0, 1, 0)$, $(0, 0, 1)$



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6. Identify the planes containing the points !

$(7, 0, 4)$, $(2, -5, 0)$, $(0, \sqrt{2}, -3)$



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7. Determine, which



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8. Find the projection of the point $(7,-5,3)$ on xy -plane,



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9. Find the projection of the point $(7,-5,3)$ on yz -plane,



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10. Find the projection of the point $(7,-5,3)$ on
zx-plane



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11. Find the projection of the point $(7,-5,3)$ on x-
axis,



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12. Find the projection of the point $(7,-5,3)$ on
y-axis



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13. Find the projection of the point $(7,-5,3)$ on
z-axis.



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14. When do you say two lines in space are skew ? Do they intersect ?



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15. From the three pairs of lines given below, identify those which uniquely determine a plane :

(i) intersecting pair, (ii) parallel pair, (iii) a pair of skew lines.



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16. Determine the unknown coordinates of the

$$P(a, 2, -1) \in yz - \text{plane}$$



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17. Determine the unknown coordinates of the

$$Q(-1, y, 3) \in zx - \text{plane}$$



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18. Determine the unknown coordinates of the

$$R(\sqrt{2}, -3, c) \in xy - \text{plane}$$



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19. Determine the unknown coordinates of the

$$S(7, y, z) \in x - \text{axis}$$



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20. Determine the unknown coordinates of the

$$T(x, 0, z) \in y\text{-axis}$$



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21. Determine the unknown coordinates of the

$$V(a, b, -3) \in z\text{-axis}$$



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22. Which axis is determined by the intersection of xy -plane and yz -plane,



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23. Which axis is determined by the intersection of yz -plane and zx -plane,



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24. Which axis is determined by the intersection of zx -plane and xy -plane.



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25. Which axis is represented by a line passing through origin and normal to xy -plane,



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26. Which axis is represented by a line passing through origin and normal to yz -plane,



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27. Which axis is represented by a line passing through origin and normal to zx -plane.



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28. What are the coordinates of a point which is common to all the coordinate planes.



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29. If A,B,C are projections of $P(3,4,5)$ on the coordinate planes, find PA , PB and PC.



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30. Find the perimeter of the triangle whose vertices are $(0,1,2)$, $(2,0,4)$ and $(-4,-2,7)$.



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31. Show that the points

(a,b,c) , (b,c,a) and (c,a,b)

form an equilateral triangle.



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32. Show that the points $(3,-2,4)$, $(1,1,1)$ and $(-1,4,-1)$ are collinear.



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33. Show that points $(0,1,2)$, $(2,5,8)$, $(5,6,6)$ and $(3,2,0)$ form a parallelogram.



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34. Show that the line segment joining $(7,-6,1)$ $(17,-18,-3)$ intersect the line segment joining $(1,4,-4),(3,-4,11)$ at $(2,0,3)$.



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35. Find the locus of points which are equidistant from the points $(1,2,3)$ and $(3,2,-1)$.



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36. Find the ratio in which the line segment through $(1,3,-1)$ and $(2,6,-2)$ is divided by zx -plane.



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37. Find the ratio in which the line segment through $(2,4,5)$, $(3,5,-4)$ is divided by xy -plane.



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38. Find the coordinates of the centroid of the triangle with its vertices at (a_1, b_1, c_1) , (a_2, b_2, c_2) , and (a_3, b_3, c_3) .



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39. If A $(1,0,-1)$, B $(-2,4,-2)$ and C $(1,5,10)$ be the vertices of a triangle and the bisector of the angle BAC, meets BC at D, then find the coordinates of the point D.



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40. Prove that the points $P(3,2,-4)$, $Q(5,4,-6)$ and $R(9,8,-10)$ are collinear. Find the ratio in which the point Q divides the line segment PR .



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