MATHS

BOOKS - A N EXCEL PUBLICATION

INTRODUCTION TO THREE DIMENSIONAL GEOMETRY

Question Bank

1. A point is on the x-axis. What are its y-coordinates and z coordinates?

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2. Name the octants in which the following points lie (1,2,3), (4,-2,3), (4,-2,-5), (4,2,-5), (-4,2,-5), (-4,2,5), (-3,-1,6), (-2,-4,-7).

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3. Fill in the blanks The x-axis and the y-axis taken together determine a plane known as...

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4. Fill in the blanks

The co-ordinates of point in XY plane are of the form...

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5. Fill in the blanks

Co-ordinate planes divide the space into... octants

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6. Find the distance between the point P (1,4,2) and Q (-1,2,0).

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7. Show that the triangle with vetices (1,2,5) (2,5,3) and (-1,3,2) is an equilateral triangle.

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8. Consider the points P (x,y,z), O (0,0,0), A(a,0,0), B(0,b,0) and C (0,0,c)

Using distance formula find PO

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9. Consider the points P (x,y,z), O (0,0,0), A(a,0,0), B(0,b,0) and C (0,0,c)

If P is equidistant from O,A,B and C, find the co-ordinates of P

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10. Consider the points A (2,4,5), B(-1,2,6) and C(-7,-2,8)

Find AB, BC and AC.

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11. Consider the points A (2,4,5), B(-1,2,6) and C(-7,-2,8)

Prove that A,B,C are collinear. Also find the ratio in which B divides AC

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12. Find the distance between the following pair of points:

$(2, 3, 5)$ and $(4, 3, 1)$

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13. Find the distance between the following pair of points:

$(-3, 7, 2)$ and $(2, 4, -1)$

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14. Find the distance between the following pair of points:

$(-1, 3, -4)$ and $(1, -3, 4)$

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15. Find the distance between the points

$(2, -1, 3)$ and $(-2, 1, 3)$

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16. Show that the points $(-2, 3, 5), (1, 2, 3)$ and $(7, 0, -1)$ are collinear.

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17. Verify the following:

$(0, 7, -10), (1, 6, -6)$ and $(4, 9, -6)$ are the

vertices of an isosceles triangle.

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18. Verify the following:

$(0, 7, 10), (-1, 6, 6)$ and $(-4, 9, 6)$ are the vertices of a right angled triangle.

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19. Verify the following:

$(-1, 2, 1), (1, -2, 5), (4, -7, 8)$ and $(2, -3, 4)$ are the vertices of a parllelogram.

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20. Find the equation of set points which are equidistant from the points $(1, 2, 3)$ and $(3, 2, -1)$.

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21. Find the equation of the set of points P, the sum of whose distances from A (4,0,0) and B (-4,0,0) is equal to 10.

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22. Consider the points P (3,4,-5) and Q (1,-2,3).Find the co-ordinates of the point which divides the join of P and Q in the ratio a)1:2 internally b)3:2 externally

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23. Consider the points P (3,4,-5) and Q (1,-2,3).Find the ratio in which the YZ plane divides the line joining P and Q

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24. Consider the points A (3,2,-4), B (5,4,-6) and C (9,8,-10).Find AB, BC and AC. Hence prove that A,B,C are collinear. Also find the ratio in which B divides AC.

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25. Consider the points A (3,2,-4), B (5,4,-6) and C (9,8,-10) Using section formula, prove that A, B, C are collinear.

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26. Suppose that A (2,6,-4), B(4,-2,3) and C (x,y,z) are the vertices of a ΔABC

Find the co-ordinates of the centroid of the triangle.

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27. Suppose that A (2,6,-4), B(4,-2,3) and C (x,y,z) are the vertices of a ΔABC

If the centroid is (7,-2,5) find the co-ordinates of C.

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28. Suppose that three consective vertices of a parallelogram ABCD are $A(1, 2, 3), B(-1, -2, -1)$ and $C(2, 3, 2)$ Taking $D(x, y, z)$, find the mid point of AC and BD

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29. Suppose that three consecutive vertices of a parallelogram ABCD are A (1,2,3), B(-1,-2,-1) and C(2,3,2).Find the co-ordinates of D

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30. Find the coordinate of the point which divides the line segment joining the points $(-2, 3, 5)$ and $(1, -4, 6)$ internally in the ratio of $2:3$.

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

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32. Given that P (3,2,-4), Q(5,4,-6) and R(9,8,-10) are collinear. Find the ratio in which Q divides PR.

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33. Find the ratio in which the YZ-plane divides the line segment formed by joining the points $(-2, 4, 7)$ and $(3, -5, 8)$.

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34. Using section formula, show that the points A (2,-3,4), B(-1,2,1) and C $(0, \frac{1}{3}, 2)$ are collinear.

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35. Find the coordinates of the points which trisect the line segment joining the points $P(4, 2, -6)$ and $Q(10, -16, 6)$.

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36. Find the distance between the points (x,-2,-3) and (3,1,-9)

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37. If the distance between the points (x,-2,-3) and (3,1,-9) is 7 units, find the values of x

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38. Consider the points A (1,2,3), B(2,3,1) and C(3,1,2).Find AB,BC and CA

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39. Consider the points A (1,2,3), B(2,3,1) and C(3,1,2)

Prove that ΔABC is equilateral

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40. Let A (0,4,1), B(2,3,-1) and C(4,5,0) be the vertices of a ΔABC. Find AB,BC and AC

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41. Let A (0,4,1), B(2,3,-1) and C(4,5,0) be the vertices of a ΔABC.Prove that ΔABC is isosceles and right angled

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42. Consider the points A (1,-1,3), B(2,-4,5) and C(5,-13,11).Find AB, BC and AC

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43. Consider the points A (1,-1,3), B(2,-4,5) and C(5,-13,11).Prove that A,B,C are collinear

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44. Consider the points A(1,2,8), B(0,3,4), C (1,1,3) and D(2,0,7)

Find the mid points of AC and BD

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45. Consider the points A(1,2,8), B(0,3,4), C(1,1,3) and D(2,0,7)

Prove that ABCD is a parallelogram

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46. Consider the points A(1,-1,1), B(5,-5,4), C(5,0,8) and D(1,4,5)

Find AB,BC,CD and DA

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47. Consider the points A(1,-1,1), B(5,-5,4), C(5,0,8) and D(1,4,5) Prove that ABCD is a rhombus

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48. Consider the points A(-5,6,8), B(1,8,11),C(4,2,9) and D(-2,0,6). Find the mid points of AC and the mid point of BD and prove that ABCD is a parallelogram

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49. Consider the points A(-5,6,8), B(1,8,11),C(4,2,9) and D(-2,0,6)

Find AC and BD and prove that ABCD is a square also

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50. Let A (2,3,5), B(-1,5,-1) and C(4,-3,2) be the vertices of a ΔABC

Find the sides AB,BC and AC

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51. Let A (2,3,5), B(-1,5,-1) and C(4,-3,2) be the vertices of a ΔABC

Prove that the area of $\Delta ABCis\frac{49}{2}$

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52. Consider the points A(2,-3,0) and B (-1,1,c)

Find the distance between A and B

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53. Consider the points A(2,-3,0) and B (-1,1,c)

If the distance is 13 units, find the values of c

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54. Consider the point A(3,2,-4) and B (9,8,-10)

Find the co-ordinates of the points which divides AB internally in the ratio 1:2

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55. Consider the point A(3,2,-4) and B (9,8,-10)

Find the co-ordinates of the points which divides AB internally in the ratio 2:3

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56. suppose that the mid point of the sides BC,CA and AB of a triangle ΔABC are (5,7,11), (0,8,5) and (2,3,-1)

If the vertices of the triangle are $A(x_1, y_1, z_1), B(x_2, y_2, z_2)$ and $C(x_3, y_3, z_3)$

derive nine equations in

$x_1, x_2, x_3, y_1, y_2, y_3, z_1, z_2,$ and z_3

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57. Suppose that the midpoints of the sides BC,CA and AB of a triangle ABC are (5,7,11), (0,8,5), and (2,3,-1).

Find the co-ordinates of A,B and C.

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58. Given the vertices A(2,-1,4), B(3,2,-6) and C(-5,0,2) of a triangle ABC

Find the mid point of BC

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59. Given the vertices A(2,-1,4), B(3,2,-6) and C(-5,0,2) of a triangle ABC

Find the length of the median drawn from the vertex A

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60. Given the points P(1,-1,3), Q(2,-4,5) and R(5,-13,11)

Prove that P,Q,R are collinear

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61. Given the points P(1,-1,3), Q(2,-4,5) and R(5,-13,11)

Find the ratio in which Q divides PR

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62. The vertices of a parallelogram ABCD are A(3,-1,2), B(1,2,-4) and C(-1,1,2). Find the 4th vertex.

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63. Find the lengths of the medians of the triangle with vertices A(0,0,6), B(0,4,0) and C(6,0,0)

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64. If the origin is the centroid of the triangle PQR with vertices P(2a,2,6), Q(-4,3b,-10) and R(8,14,2c) then find the values of a,b and c

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65. Find the co-ordinates of a point on y-axis which are at a distance of $5\sqrt{2}$ from the point P(3,-2,5)

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66. A point R with x-coordinate 4 lies on the line segment joining the points P(2,-3,4) and Q(8,0,10) find the co-ordinates of R.

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67. If A and B are the points (3,4,5) and (-1,3,-7) respectively, find the equation of the set of points P such that $PA^2 + PB^2 = k^2$ where k is a constant.

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