



MATHS

NCERT - NCERT

MATHEMATICS(TELUGU)

INTRODUCTION TO THREE
DIMENSIONAL GEOMETRY

Example

1. Express each of the following decimals in the

$\frac{p}{q}$ form

99.12



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2. Find the octant in which the points $(-3,1,2)$

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



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3. Find the distance between the points $P(1,-3,4)$ and $Q(-4,1,2)$



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4. The points $(-2, 3, 5)$ $(1,2,3)$ $(7,0,-1)$ are



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5. Are the points $A(3,6,9)$ $B(10,20,30)$ and $C(25,-41,5)$ the vertices of a right angled

triangle



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



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7. Find the coordinates of the point which divides the line segment joining the points

$(1,-2,3)$ and $(3,4,-5)$ in the ratio $2:3$ (i) internally
and (ii) externally



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8. Using section formula prove that the three points $(-4,6,10)$, $(2,4,6)$ and $(14,0,-2)$ are collinear



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9. Find the coordinates of the centroid of the triangle whose vertices are

(x_1, y_1, z_1) , (x_2, y_2, z_2) and (x_3, y_3, z_3)



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10. Find the ratio in which the line segment joining the points $(4, 8, 10)$ and $(6, 10, -10)$ is divided by the YZ plane



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11. Find the equation of the set of the point P such that its distances from the points

A(3,4,-5) and B(-2,1,4) are equal



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12. The centroid of a triangle ABC is at the point (1,1,1) if the coordinates of A and B are (3,-5,7) and (-1,7,-6) respectively find the coordinates of the point C



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Exercise 12 1

1. A point is on the x axis what are its y coordinates and z coordinates



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2. A point is in the XZ plane what can you say about its y coordinate



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3. 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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4. Fill in the blanks

(i) The x axis and y axis taken together determine a plane known as _____

(ii) The coordinates of points in the XY plane

are of the form _____

(iii) Coordinate planes divide the space into _____ octants



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Exercise 12 2

1. Find the distance between the following pairs of points

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

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

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

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



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2. Express each of the following decimals in

the $\frac{p}{q}$ form

102.2



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



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



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Exercise 12 3

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



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2. 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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3. 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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4. 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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Miscellaneous Exercise

1. Three vertices of a parallelogram ABCD are $A(3,-1,2)$, $B(1,2,-4)$ and $C(-1,1,2)$ find the coordinate of the fourth vertex



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2. 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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3. 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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4. Find the coordinates 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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5. A point R with X coordinate 4 lie on the line segment joining the points $P(2,-3,4)$ and $Q(8,0,10)$ find the coordinates of the pont R



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6. If A and B be 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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