



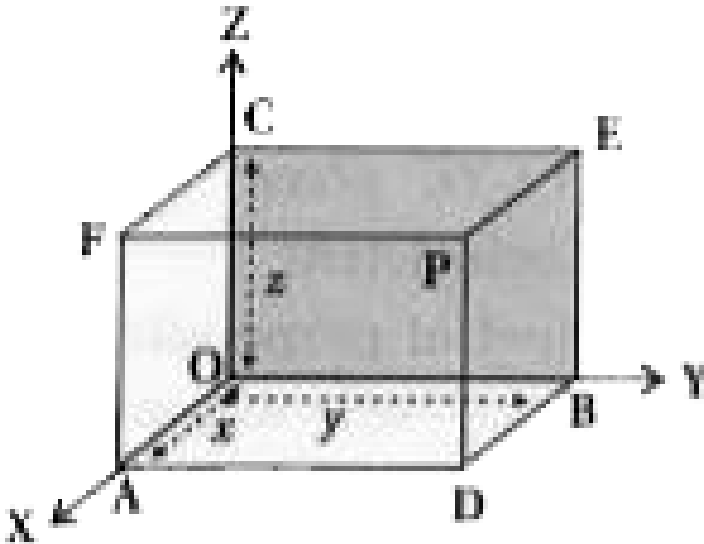
MATHS

NCERT - NCERT MATHEMATICS (GUJRATI)

INTRODUCTION TO THREE DIMENSIONAL GEOMETRY

Example

1. In Figure, if P is $(2, 4, 5)$, find the coordinates of F.



[Watch Video Solution](#)

2. Find the octant in which the point $(-3, 1, 2)$ and $(-3, 1, -2)$ lie.



[Watch Video Solution](#)

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



[Watch Video Solution](#)

4. Show that the points $P(-2, 3, 5)$, $Q(1, 2, 3)$ and $R(7, 0, -1)$ are collinear.



[Watch Video Solution](#)

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



[Watch Video Solution](#)

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.



[Watch Video Solution](#)

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.





[Watch Video Solution](#)

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



[Watch Video Solution](#)

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) .



[Watch Video Solution](#)

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



[Watch Video Solution](#)

11. Show that the points $A(1,2,3)$, $B(-1,-2,-1)$, $C(2,3,2)$ and $D(4,7,6)$ are the vertices of a parallelogram ABCD but it is not a rectangle



[Watch Video Solution](#)

12. Find the equation of the set of the points P such that its distance from the points A(3, 4, -5) and B(-2, 1, 4) are equal.



[Watch Video Solution](#)

13. 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.



[Watch Video Solution](#)

Exercise 12 1

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



[Watch Video Solution](#)

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



[Watch Video Solution](#)

3. Name the octants in which the following points lie :

$(1, 2, 3)$, $(4, -2, 3)$, $(4, -2, -5)$, $(4, 2, -5)$, $(-4, 2, -5)$, $(-4, 2, 5)$, $(-3, -1, 6)$, $(2, -4, -7)$



Watch Video Solution

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



[Watch Video Solution](#)

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 $(-2,1,3)$



Watch Video Solution

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



Watch Video Solution

3. Verify the following :

$(0, 7, -10)$, $(1, 6, -6)$ and $(4, 9, -6)$ are the vertices of an isosceles triangle.



Watch Video Solution

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



Watch Video Solution

5. 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



[Watch Video Solution](#)

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.



[Watch Video Solution](#)

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 .



[Watch Video Solution](#)

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



[Watch Video Solution](#)

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



[Watch Video Solution](#)

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



[Watch Video Solution](#)

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 coordinates of the fourth vertex.



[Watch Video Solution](#)

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

(6, 0, 0).



Watch Video Solution

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 .



Watch Video Solution

4. Find the co-ordinates of a point on Y-axis which are at a distance of $5\sqrt{2}$ from the point

$P(3, -2, 5)$.



Watch Video Solution

5. 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 coordinates of the point R.



Watch Video Solution

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.



Watch Video Solution