

**CHAPTER 12**

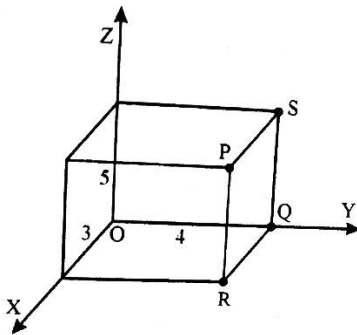
**THREE DIMENSIONAL GEOMETRY**

**DECEMBER 2020**

1. A point R with coordinate 4 lies on the line segment joining the points P(2, -3,4) and Q(8, 0, 10).
  - a) Find the ratio in which R divides PQ. (1)
  - b) Find the coordinates of R (2)

**MARCH 2020**

2. Consider the following figure.



- a) Find the distance PQ. (1)
- b) Find the coordinates of the point divides the line segment joining the points P and Q internally in the ratio 2:3. (2)

**IMPROVEMENT 2019**

3. a) Origin is the centroid of  $\Delta PQR$  with vertices  $P(2a,2,6), Q(-4,3b,-10)$  and  $R(8,14,2c)$  find the values of a, b and c. (2)
- b) Find length of the values of a, b and c. (1)
- c) The ratio in which the YZ plane divides the segment joining the points  $(-2,4,7)$

and  $(3,-5,8)$  is ..... (1)

**MARCH 2019**

4. Let  $A(0,7,10), B(-1,6,6)$  and  $C(-4,9,6)$  are the vertices of a triangle.
  - a) Show that it is a right triangle. (3)
  - b) Find the coordinate of the centre of the circle passing through the points A,B and C. (1)

**IMPROVEMENT 2018**

5. Consider the points  $A = (3,8,10)$  and  $B = (6,10,-8)$ 
  - a) Find the ratio in which the line segment joining A and B is divided by the YZ-coordinate plane. (2)
  - b) Find the coordinates of the point of division. (1)
  - c) Which coordinate plane divides the line segment AB internally? Justify your answer. (1)

**MARCH 2018**

6. Consider a point  $A(4,8,10)$  in space.
  - a) Find the distance of the point A from XY- plane. (1)
  - b) Find the distance of the point A from X-axis. (1)
  - c) Find the ratio in which the line segment joining the point A and B  $(6,10,-8)$  is divided by YZ – plane. (2)

**IMPROVEMENT 2017**

7. a) Co-ordinates of a point on XY plane is .....
- i) (1,2,0)                      ii) (2,-3,-1)
- iii) (0,3,1)                    iv) (4,0,1)                      (1)
- b) Find the ratio in which the XY plane divides the line segment joining the points (-2,4,7),(3,-5,8).                      (2)

**MARCH 2017**

8. a) The distance between the point (1,-2,3) and (4,1,2) is .....
- i)  $\sqrt{12}$                       ii)  $\sqrt{19}$
- iii)  $\sqrt{11}$                       iv)  $\sqrt{15}$                       (1)
- b) The centroid of triangle ABC is at the point (1,2,3). If the coordinates of A and B are (3,-5,7) and (-1,7,-6) respectively. Find the coordinates of the point C.                      (2)

**IMPROVEMENT 2016**

9. a) State whether the following is TRUE or FALSE. " The point (4,-2,-5) lies in the eight octant".
- b) Find the equation of the set of points such that its distance from the points A(3,4,-5) and B (-2,1,4) are equal.

**MARCH 2016**

10. a) Which one of the following points lies in the sixth octant?
- i) (-4, 2, -5)                      ii) (-4, -2, -5)
- iii) (4,-2, -5)                      iv) (4,2,5)                      (1)
- b) Find the ratio in which the YZ plane divides

the line segment formed by joining the points (-2,4,7) and (3,-5,8)                      (3)

**IMPROVEMENT 2015**

11. a) Which of the following is lies in the sixth octant?                      (1)
- i) (-3,-1,-2)                      ii) (-3,1,-2)
- iii) (3,-1,2)                      iv) (3,-1,-2)
- b) Find the ratio in which the YZ plane divides the line joining the points (-2,4,7) and (3,-5,8).                      (3)

**MARCH 2015**

12. a) A point in the XZ plane is .....
- i) (1,1,1)                      ii) (2,0,3)
- iii) (2,3,0)                      iv) (-1,2,3)
- b) 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.                      (3)

**IMPROVEMENT 2014**

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

**MARCH 2014**

14. a) Find the distance between the points (2,3,5) and (4,3,1).
- b) Find the ratio in which the line segment joining the points A (4,8,10) and B(6,10,-8) is divided by the XY pane.

**IMPROVEMENT 2013**

15. a) If P is a point in YZ-plane, then its x coordinate is .....
- b) Find the ratio in which the YZ-plane divides the line segment formed by joining the points  $(-2,4,7)$  and  $(3,-5,8)$ .

**MARCH 2013**

16. a) Find the distance between the points  $(2,-1,3)$  and  $(-2,1,3)$ .
- b) Find the coordinates 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.

**IMPROVEMENT 2012**

17. The vertices of  $\Delta ABC$  are  $A(2,1)$ ,  $B(-3,5)$  and  $C(4,5)$
- a) Write the co-ordinates of the midpoint of AC.
- b) Find the equation of the medial through the vertex B.

**MARCH 2012**

18. a) If  $\left(\frac{5}{3}, \frac{22}{3}, \frac{-22}{3}\right)$  is the centroid of  $\Delta PQR$  with vertices P  $(a,7,-10)$ , Q  $(1, 2b,-6)$ , R  $(4,9,3c)$ , find the values of a, b and c.
- b) Prove that  $\Delta PQR$  is isosceles.

**IMPROVEMENT 2011**

19. a) Determine a point on the x axis which is equidistant from the points  $(-2,3,5)$  and  $(1,2,3)$ .

- b) If the centroid of the triangle with vertices  $(a,2,5)$ ,  $(1,b,0)$  and  $(-3,-1,c)$  is  $(1,2,3)$ , then find a, b and c.

**MARCH 2011**

20. Consider the points A  $(-2,3,5)$ , B  $(1, 2, 3)$  and C  $(7, 0, -1)$ .
- a) Using the distance formula. Show that the points A,B and C are collinear.
- a) Find the ratio in which B divides the line segment AC.

**SEPTEMBER 2010**

21. a) Find the co-ordinates of the points which trisect the line segment joining the points P  $(4, 0, 1)$  and Q  $(2, 4, 0)$ .
- b) Find the locus of the set of points P such that the distance from A  $(2,3,4)$  is equal to twice the distance from B  $(-2,1,2)$ .

**MARCH 2010**

22. Consider the triangle with vertices A  $(0,7,-10)$ , B  $(1,6,-6)$ , C  $(4,9,-6)$ .
- i) Find the sides AB, BC, AC
- ii) Prove that the triangle is right angled.
- iii) Find the centroid of the triangle.

**IMPROVEMENT 2009**

23. Consider the points A  $(-2,4,7)$  and B  $(3,-5,8)$ .
- i) If P divides AB in the ratio k:1, then find the co-ordinates of P.
- ii) Find the co-ordinates of the point where the line segment AB crosses the YZ-plane.

**MARCH 2009**

24. Consider the points A(2,1,3) and B(1,2,1):
- Find the ratio in which the join of AB is divided by YZ plane.
  - Also find the point of division.
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