MATHS

BOOKS - MAXIMUM PUBLICATION

INTRODUCTION TO THREE DIMENSIONAL GEOMETRY

Example

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

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

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

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

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

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

4. Prove by using distance formula that the

$A(1, 2, 3), B(-1, -1, -1)$ and $C(3, 5, 7)$

are collinear.

5. Verify the following:

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

the

vertices of an isosceles triangle.

6. Verify the following:

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

vertices of a right angled triangle.

7. Verify the following:

$(- 1, 2, 1),(1, \ - 2, 5),(4, \ - 7, 8)$ and $(2, \ - 3, 4)$ are

the vertices of a parllelogram.

8. Find the equation of set points which are

equidistant from the points $(1, 2, 3)$ and $(3, 2, \ - 1)$.

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

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

11. Find the ratio in which the line joining the points $(1, 2, 3)$ and $(- 3, 4, - 5)$ is divided by the xy-plane.

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

13. Consider the triangle with vertices

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

Find the sides AB,BC and CA.

14. Consider the triangle with vertices

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

Prove that the triangle is right triangle.

15. Consider the triangle with vertices $(0, 7, -10)$,$(1, 6, -6)$ and $(4, 9, -6)$

Find the centroid of the triangle.

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16. Find the co-ordinates of the points which trisect the line segment joining the points $P(4, 0, 1)$ and $Q(2, 4, 0)$.

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17. 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 $B(- 2, 1, 2)$.

18. Write the coordinate 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)

19. If the centroid of the triangle ABC is $(1, 1, 1)$ and A and B are $(3, -5, 7),(1, 1, 2)$ then find the coordinate of C.

20. Given three points $A(-4, 6, 10)$, $B(2, 4, 6)$ and $C(14, 0, -2)$ Find AB.

21. Given three points $A(-4, 6, 10), B(2, 4, 6)$ and $C(14, 0, -2)$

Prove that the points A,B and C are collinear.

22. Name the octants in which the points $A(1, 6, -6)$ and $B(-1, -6, -6)$. Find the distance between A and B.

23. If P is a point in YZ-plane,then its x coordinate is...........

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

25. Find the distance between the points

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

26. 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 $2 : 3$.

27. Name the octant in which the points $(3, \; -2, 1)$ and $(\; -5, \; -6, 1)$ lie.

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

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29. Find the centroid of the triangle with vertices $(3, -5, 7), (-1, 7, -6)$ and $(1, 1, 2)$.

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

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

32. State whether the following is TRUE or FALSE.

"The point $(4, -2, -5)$ lies in the eight octant."

33. Find the equation of the set of points such that its distances from the points

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

34. The distance between the point

$(1, -2, 3)$

and $(4, 1, 2)$ is........

A. $\sqrt{12}$

B. $\sqrt{19}$

C. $\sqrt{11}$

D. $\sqrt{15}$

Answer: B

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35. The centroid of the 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.

36. Consider the points $A(-2, 3, 5)$, $B(1, 2, 3)$ and $C(7, 0, -1)$ Using the distance formula,show that the points A,B and C are collinear.

37. Consider the points $A(-2, 3, 5)$, $B(1, 2, 3)$ and $C(7, 0, -1)$ Find the ratio in which B divides the line segment AC.

38. The x-coordinate of the point in the YZ plane is…………

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

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40. Find the distance between the points $(2, 3, 5)$ and $(4, 3, 1)$.

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41. 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 plane.

42. A point in the XZ plane is .... a) (1,1,1) b) (2,0,3)

A. $(1, 1, 1)$

B. $(2, 0, 3)$

C. $(2, 3, 0)$

D. $(-1, 2, 3)$

Answer: B

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43. 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.

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44. Which of the following lies in the sixth octant?

A. $(-3, -2, -2)$

B. $(-3, 1, -2)$

C. $(3, -1, 2)$

D. $(3, -1, -2)$

Answer: B

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

46. Which one of the following points lies in the sixth octant?

A. $(-4, 2, -5)$

B. $(-4, -2, -5)$

C. $(4, -2, -5)$

D. $(4, 2, 5)$

Answer: A

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47. 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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48. If $\left(\dfrac{5}{3}, \dfrac{22}{3}, \dfrac{-22}{3} \right)$ is the centroid of

$\triangle PQR$ with vertices $P(a, 7, -10)$,

Q(1,2b,-6) and R(4,9,3c)`, Find the value of a,b,c.