MATHS

BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

COORDINATE SYSTEM (3D)

Solved Examples

1. If $A(1, 2, 3), B(0, 1, 2)$ and $C(2, 1, 0)$ are vertices of a triangle , then the length of the median through A is

A. $\sqrt{5}$

B. $2\sqrt{5}$

C. 5

D. 10

Answer: A

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2. If $A(1, 2, 3), B(4, 3, 2)$ and $C(5, 2, 7)$ are three vertices of a tetrahedron for which the centroid is $(4, 5/2, 5)$, the fourth vertex is

A. $(6, 5, 8)$

B. $(6, 4, 8)$

C. $(5, 4, 8)$

D. $(6, 4, 5)$

Answer: B

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3. The points $(2, 5, -4), (4, 7, -6), (1, 4, -3)$ are

A. collinear

B. vertices of a right angled triangle

C. vertices of an equilateral triangle

D. vertices of an isosceles triangle

Answer: A

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4. The point which divides the line segment the points $(-2, 3, 5), (1, 2, 3)$ in the ratio 2 : 3 externally is

A. $(-4/5, 13/5, 21/5)$

B. $(13/7, 2/7, 15/7)$

C. $(-3/2, 1/2, 9)$

D. $(-8, 5, 9)$

Answer: D

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5. $A(5, 3, 2), B(-1, 0, -4), C(1, 1, -2)$ are collinear , then the ratio in which B divides $\overline{AC}$ is

A. $1:3$

B. $2:3$

C. $3:-1$

D. $1:2$

Answer: C

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6. If H,G,S, I are respectively othercentre centroid , circumcentre and incentre of a triangle formed by the points (1,2,3), (2,3,1) and (3,1,2) . Then H + G + S + I =

A. (2,2,2)

B. (4,4,4)

C. (6,6,6)

D. (8,8,8)

Answer: D

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7. The shortest distance between (0 , 0, 0) and $(2\sin t, 2\cos t, 3t)$ is :

A. 4

B. 3

C. 2

D. 1

Answer: C

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8. If L and M are the feet of the perpendiculars from the point (2,4,5) to the planes XY and YZ, then distance LM is :

A. $\sqrt{20}$

B. $\sqrt{29}$

C. $3\sqrt{2}$

D. $4\sqrt{2}$

Answer: B

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9. The line $\frac{x-2}{3}=\frac{y+1}{2}=\frac{z-1}{-1}$ intersects the curve $xy=c^2, z=0$ if c =

A. $\pm\sqrt{7}$

B. $\pm\sqrt{5}$

C. $\pm\sqrt{5}$

D. ± 1

Answer: B

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Exercise 1

1. The distance the points (-1,2,-3) ,(5,4,-6) is

A. 1

B. 3

C. 6

D. 7

Answer: D

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2. The distance the points $(\sin\alpha, \cos\alpha, 0), (\cos\alpha, -\sin\alpha, 0)$ is

A. 1

B. $\sqrt{2}$

C. 2

D. $\tan\alpha$

Answer: B

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3. The distance between the points (-1,2,3) and P is 13. Then P =

A. $(2, 6, -9)$

B. $(-2, 6, 9)$

C. (2 , 6, 9)

D. $(-2, -6, -9)$

Answer: A

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4. The distance between the points (5,-1,7) and (c,5, 1) is 9 then c =

A. 8

B. 4

C. -8

D. -4

Answer: A

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5. The distance of point (7,-8,15) from the x -axis is

A. 17

B. $\sqrt{34}$

C. $\sqrt{25}$

D. $\sqrt{20}$

Answer: A

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6. The distance of point P (1,2,3) from the coordinate axes are

A. $\sqrt{13}, \sqrt{10}, \sqrt{5}$

B. $\sqrt{11}, \sqrt{10}, \sqrt{5}$

C. $\sqrt{13}, \sqrt{20}, \sqrt{15}$

D. $\sqrt{23}, \sqrt{10}, \sqrt{5}$

Answer: A

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7. The perimeter of the triangle with vertices at (1, 0,0), (0,1,0) and (0,0,1) is :

A. 3

B. 2

C. $2\sqrt{2}$

D. $3\sqrt{2}$

Answer: D

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8. The points (3,2,-4),(5,4,-6) , (9,8,-10)are

A. collinear

B. vertices of a right angled triangle

C. vertices of an equilateral triangle

D. vertices of an isosceles triangle

Answer: A

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

A. collinear

B. vertices of a right angled triangle

C. vertices of an equilateral triangle

D. vertices of an isosceles triangle

Answer: A

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10. The point collinear with (1, -2 -3) and (2, 0, 0) among the following is

A. (0,4,6)

B. (0,-4,-5)

C. (0,-4,-6)

D. (0,-4,6)

Answer: C

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11. The points (1,2,3), (2,3,1), (3,1,2) from

A. isosceles triangle

B. equilateral triangle

C. right angled triangle

D. right angled isosceles triangle

Answer: B

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12. The points (3,4,5) (2,3,1), (-1,6,1) from

A. equilateral triangle

B. isosceles triangle

C. right angled triangle

D. right angled isosceles triangle

Answer: D

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13. The points (1,1 ,1) ,(1,2,3),(2-1, 1) form

A. isosceles triangle

B. equilateral triangle

C. right angled triangle

D. right angled isosceles triangle

Answer: A

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14. The centroid of the triangle formed by the points $(1, 2, 3), (3, -1, 5), (4, 0, -3)$ is

A. right angled triangle

B. isosceles triangle

C. equilateral triangle

D. right angled isosceles triangle

Answer: A

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15. If (1,2,3), (2,3,1) are two vertices of an equilateral triangle then its third vertex is

A. $(3, 1, 2)$

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

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

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

Answer: A

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16. The coplanar points (3,2,1), (5,6,5),(2,1,2)(0,-3,-2) from a

A. square

B. rectangle

C. rhombus

D. parallelogram

Answer: D

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17. The coplanar points (1,2,2) ,(2,-1 , 0) ,(1,1,3),(0,4,5,) from a

A. parallelogram

B. rectangle

C. square

D. rhombus

Answer: D

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18. The coplanar points (1,2,4),(-2,2,1), (2,4,-3) ,(5,4,0) form

A. parallelogram

B. square

C. rhombus

D. rectangle

Answer: D

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19. The coplanar points (3,2,5) , (2,1,1),(-1,4,1),(0,5,5) form a

A. parallelogram

B. square

C. rhombus

D. rectangle

Answer: B

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20. The midpoint of the line segment joining (2,3,-1), (4,5,3,) is

A. (3,4,1)

B. (4,1,3)

C. (3,-4,-1)

D. (-4,1,3)

Answer: A

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21. If (2,3,-1), is the midpoint of $\overline{AB}$ Where A = (-1,5,3) then B =

A. (5,-1,5)

B. (5,1,-5)

C. (-5,1,5)

D. (5,-1,-5)

Answer: A

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22. The points which divides the join of (3,-2,1) and (-2,3,11) in the ratio 2 : 3 is :

A. (1,1,4)

B. (1,0,5)

C. (2,3,5)

D. (0,6,-1)

Answer: B

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23. The point which divides the line segment joining the points (1,2,3), (3,-2,1)in the ratio 3 : 4 is

A. (8/5,-1,13/5)

B. (13/7,2/7,15/7)

C. (-3/2,1/2,9)

D. (4,-7,6)

Answer: B

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24. The point which divides the line segment joining the points (1,-1,2) , (2,3,7)in the ratio - 2 : 3 is

A. (-1,-9,-8)

B. (13/7,2/7,15/7)

C. (-3/2,1/2,9)

D. (4,-7,6)

Answer: A

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25. The coordinates of the point which divides the line joining the points (2,3,4) and (3,-4, 7) in the ratio : 2 :4 externally is

A. (10,1,1)

B. (1,10,1)

C. (10,-10,10)

D. (1,1,10)

Answer: B

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26. If the line joining A (1,3, 4)and B is divided by the point (-2, 3,5)in the ratio 1:3, then B is

A. $(-11, 3, -8)$

B. $(-8, 12, 20)$

C. $(13, 6, -13)$

D. $(-11, 3, 8)$

Answer: D

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27. The points of trisection of line segment joining (2,-3,5) ,(3,1,-2) are

A. $(8/3, -1/3, 1/3), (7/3, -5/3, 8/3)$

B. $(7/3, 4, 13/3), (8/3, 3, 14/3)$

C. $(-8/3, -1/3, 1/3), (7/3, -5/3, 8/3)$

D. $(-7/3, 4, 13/3), (8/3, 3, 14/3)$

Answer: A

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28. The ratio in which (5, 4,-6) divides the line segment joining (3,2,-4) , (9,8,-10) is

A. $2:1$

B. $1:2$

C. $2:3$

D. $3:2$

Answer: B

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29. If A (3,2,-4), B (5,4 -6),C (9,8,10)are collinear then the ratio in which B divides $\overline{AC}$ is

A. $1:2$

B. $2:3$

C. $2:1$

D. $1:1$

Answer: A

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30. If X-coordinate of a point P on the line joining the points Q (2,2,1) and R(5,1,-2) is 4, then the z-coordinate of P is

A. -2

B. -1

C. 1

D. 2

Answer: B

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31. The ratio in which xy- plane divides the line segment joining (-2,3,1) ,(3,5,2,) is

A. $1 : -2$

B. $2 : 1$

C. $2 : 3$

D. $3 : 2$

Answer: A

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32. The ratio in which yz-plane divides the line segment joining (3,4,5) (2,-3,1)is

A. $1 : 2$

B. $2 : 1$

C. $1 : 3$

D. $3:-2$

Answer: D

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33. The ratio in which yz-plane divides the line segment joining (-3,4,2), (2,1,3) is

A. $-4:1$

B. $3:2$

C. $-2:3$

D. $1:4$

Answer: B

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34. XOZ plane divides the join of (2,3,1) and (6,7,1) in the ratio

A. $3:7$

B. $2:7$

C. $-3:7$

D. $-2:7$

Answer: C

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35. The ratio in which the line segment joining the points $A(-2,3,7), B(6,-1,2)$ is divided by the yz - plane is

A. $1:3$

B. $5:4$

C. $5:-4$

D. $3:1$

Answer: A

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36. The line segment joining points A (2,4,5) , B(3,5,-4) intersects xy -plane at the point

A. (0,19/5,4/5)

B. (0,4,5)

C. (23/9,41/9,0)

D. (0,0,0)

Answer: C

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37. The line joining the points (2,3,4) and (4,10,7) intersects the line joining (2,-1,5) and (4,-30,17) . Then the coordinates of the point of

intersection are

A. (6/4,-8/9,33/9)

B. (16/9,20/9,33/9)

C. (16/4,38/9,13/9)

D. (0,2,3)

Answer: B

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38. The line passing through the points (5,1,a) and (3,b,1) cross the yz - plane at the point (0,17/2,-13/2) .Then

A. $a = 4, b = 6$

B. $a = 6, b = 4$

C. $a = 8, b = 2$

D. $a = 2, b = 8$

Answer: B

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39. The harmonic conjugate of (2,3,4) w.r.t the points $(3, -2, 2), (6, -17, -4)$ is

A. $(18/5, -5, 4/5)$

B. (11,-16,2)

C. (1/2,1/3,1/4)

D. (0,0,0)

Answer: A

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40. Find the fourth vertex of the parallelogram whose consecutive vertices are $(2, 4, -1), (3, 6, -1)$ and $(4, 5, 1)$.

A. (3 ,3 ,1)

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

C. (2,2/3,2)

D. (5,0,1)

Answer: A

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41. The fourth vertex of the square whose consecutive vertices are $(4, 5, 1), (2, 4, -1), (3, 6, -3)$ is

A. (-4,2,4)

B. (4,-2,-4)

C. $(5, 7, -1)$

D. (5,0,1)

Answer: C

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42. The centroid of the triangle formed by the points $(2, 3, -1), (5, 6, 3), (2, -3, 1)$ is

A. (2,-1,3)

B. (-2,1,3)

C. (2,1,-3)

D. (3,2,1)

Answer: D

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43. If the origin is the centroid of the triangle for which $(2, -3, 5), (-1, 2, -2)$ are two vertices then the third vertex is

A. (1,2,9)

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

C. $(-1, -2, -9)$

D. $(1, -2, -9)$

Answer: B

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44. If (2,1,1) is the centroid of the triangle for which (3,2,-1) ,(2,-2,5) are two vertices then the third vertex is

A. (1,2,9)

B. (10,4,-9)

C. (1,-5,-2)

D. (1,3,-1)

Answer: D

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45. If the centroid of the triangle formed by $(a, 1, 3), (-2, b, -5)$ and $(4, 7, c)$ is the origin then (a,b,c) =

A. (2,8,2)

B. (2,8,-2)

C. (-2,-8,2)

D. (2,-8,2)

Answer: C

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46. The centroid of the tetrahedron formed by the points (3,2,5) ,(-3,8,-5) , (-3,2,1) ,(-1,4,-3) is

A. (0,-1,5/2)

B. (5/4 , 3/4, 7/4)

C. $(-1, 4, -1/2)$

D. (5,-1,10)

Answer: C

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47. If the origin is the centroid of the tetrahedron for which (2,-1,3) ,(-1,3,1) , (3,4,-2) are three vertices then the fourth vertex is

A. (4,6,2)

B. $(-4, -6, -2)$

C. $(-4, 6, -2)$

D. (4,-6,2)

Answer: B

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48. If (2,3,4) is the centroid of the tetrahedron for which $(2, 3, -1), (3, 0, -2), (-1, 4, 3)$ are three vertices then fourth vertex is

A. (4,5,16)

B. (3,2,4)

C. (2,3,4)

D. (2,2,12)

Answer: A

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49. The centroid of the tetrahedron ABCD divides the line joining the vertex A to the centroid of ΔABC in the ratio

A. $1:2$

B. $2:1$

C. $1:3$

D. $3:1$

Answer: D

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50. The centroid of the triangle formed by the points $(1, 2, 3), (3, -1, 5), (4, 0, -3)$ is

A. $(2, 1/2, 4)$

B. (7/2,-1/2,1)

C. (5//2,1,0)

D. (8/3,1/3,5/3)

Answer: D

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51. The centroid of the triangle formed by the points $(1, 2, 3), (2, 3, 1), (3, 1, 2)$ is

A. (2,2,2)

B. (1,1,1)

C. (2,-2,1)

D. (-1,2,2)

Answer: A

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52. The centroid of the triangle formed by the points $(2, -1, 1), (1, -3, -5), (3, -4, -4)$ is

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53. The centroid of the triangle formed by the points $(2, 1, 5), (3, 2, 3), (4, 0, 4)$ is

A. (2,1,5)

B. (3,2,3)

C. (4,0,4)

D. (3,1,4)

Answer: D

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54. If the orthocentre and the circucentre of are (-3,5,2) ,(6,2,5) then its centroid is

A. (3,3,4)

B. (3/2,7/2,7/2)

C. (-9/2,7/2,-3/2)

D. (9/2,-3/2,3/2)

Answer: A

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55. If the orthocentre and the circucentre of a triangle are $(-3, 5, 1), (3, 3, -1)$ then the centroid is

A. (1,11/3,-1/3)

B. (0,2,0)

C. (6,-2,-2)

D. (-6,2,2)

Answer: A

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56. The incentre of the triangle formed by (0,0,0),(3,0,0),(0,4,0) is

A. (1,1,0)

B. (1,0,1)

C. (0,1,1)

D. (1,1,1)

Answer: A

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57. A : If $(2, 1, -3), (-2, 3, 4), (1, 2, 2)$ are the midpoints of $\overline{BC}, \overline{CA}, \overline{AB}$ of ΔABC then $A = (-3, 4, 9)$

R : If $(\alpha_1, \beta_1, \gamma_1), (\alpha_2, \beta_2, \gamma_2), (\alpha_3, \beta_3, \gamma_3)$ are the midpoints of the sides $\overline{BC}, \overline{CA}, \overline{AB}$ of ΔABC then $A = (\alpha_2 + \alpha_3 - \alpha_1, \beta_2 + \beta_3 - \beta_1, \gamma_2 + \gamma_3 - \gamma_1)$

A. (0,5/2,5/3)

B. (5,0,-5)

C. (-1,2,-1)

D. (1,6,3)

Answer: A

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58. The points D,E,F are the midpoints of the sides $\overline{BC}, \overline{CA}, \overline{AB}$ of ΔABC respectively.

If $A = (-2, 3, 4), D = (1, -4, 2), E = (-5, 2, 3)$ then F =

A. (-8,9,1)

B. (4,-3,3)

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

D. (-6,1,3)

Answer: B

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59. $D(2,1,0), E(2,0,0), F(0,1,0)$ are midpoints of the sides BC,CA,AB of ΔABC respectively . The , the centroid of ΔABc is

A. $\left(\frac{1}{3}, \frac{1}{3}, \frac{1}{3}\right)$

B. $\left(\frac{4}{3}, \frac{2}{3}, 0\right)$

C. $\left(-\frac{1}{3}, \frac{1}{3}, \frac{1}{3}\right)$

D. $\left(-\frac{2}{3}, \frac{1}{3}, \frac{1}{3}\right)$

Answer: B

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60. In ΔABC the mid-point of the sides AB,BC and CA are respectively (l,0,0),(0,m,0) and (0,0,n) . Then $\frac{AB^2 + BC^2 + CA^2}{l^2 + m^2 + n^2} =$

A. 2

B. 4

C. 8

D. 16

Answer: C

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61. If the extremities of a diagonal of square are $(1, -2, 3), (2, -3, 5)$ then the length of its side is

A. $\sqrt{6}$

B. $\sqrt{3}$

C. $\sqrt{5}$

D. $\sqrt{7}$

Answer: B

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62. If (5,7,10),(1,9,6) are the extremities of the hypotenuse of a right angled isosceles

A. (4,6,6)

B. (4,7,-7)

C. (7,4,7)

D. (4,7,7)

Answer: A

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63. The circumradius of the triangle formed by the points (2,-1,1),(1,-3,-5) , (3,-4,-4) is

A. $\frac{1}{2}\sqrt{6}$

B. $\frac{1}{2}\sqrt{35}$

C. $\frac{1}{2}\sqrt{41}$

D. $\sqrt{41}$

Answer: C

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64. The distance between the circumcentre and the orthocentre of the triangle formed by (1,2,3),(3,-1,5),(4,0,-3) is

A. $\frac{1}{2}\sqrt{17}$

B. $\frac{1}{2}\sqrt{66}$

C. $\frac{7}{2}$

D. $\frac{1}{2}\sqrt{7}$

Answer: B

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65. The distance between the circumcentre and the orthocentre of the triangle formed by the points (2, 1, 5), (3, 2, 3) and (4, 0, 4) is

A. $\sqrt{6}$

B. $\frac{1}{2}\sqrt{6}$

C. 3

D. 0

Answer: D

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66. If the points (3,2,-4) ,(5,4k),(9,8-10)are collinear then k =

A. 6

B. 3

C. -6

D. -3

Answer: C

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67. If (k,1,5) ,(1,0,3),(7,-2,1) are collinear then `(k,-1)=

A. $(-2, -1)$

B. (2,1)

C. $(-2, 1)$

D. (2,-1)

Answer: A

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68. The locus of a point which is at a distance of 5 unit from (2,1,-3) is

A. $x^2 + y^2 + z^2 + 2x + 4z + 5 = 0$

B. $x^2 + y^2 + z^2 + 2x - 4z - 20 = 0$

C. $x^2 + y^2 + z^2 - 2x - 4z + 5 = 0$

D. $x^2 + y^2 + z^2 - 4x - 2y + 6z - 11 = 0$

Answer: D

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69. The locus of a point which is at a distance of 2 unit from yz - plane is

A. $x^2 - 4 = 0$

B. $x^2 - 25 = 0$

C. $x^2 + 15 = 0$

D. $x^2 - 15 = 0$

Answer: A

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70. The locus of the point which is equidistant from xy plane and yz - plane is

A. $y^2 - z^2 = 0$

B. $z^2 - x^2 = 0$

C. $x^2 - y^2 = 0$

D. $x^2 + y^2 + z^2 = 0$

Answer: B

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71. The locus of point which is equidistant from the points (-2,2,3),(3,4,5) is

A. $10x + 4y + 4z - 33 = 0$

B. $10x - 5y + 2z = 0$

C. $10x - 5y - 2z = 0$

D. $10x + 5y - 2z = 0$

Answer: A

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72. The locus of a point for which the sum of the squares of the distances from the coordinate planes is 5 unit is

A. x + y + z = 4

B. x + y + z = 2

C. $x^2 + y^2 + z^2 = 4$

D. `x^2 + y^2 + z^2 = 5/2

Answer: D

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73. The locus of a point P from which the distance to the point (1,1,1) is double the distance from P to the yz - plane is

A. $3x^2 - 3y^2 + z^2 - 4x + 6y - 8z + 29 = 0$

B. $3x^2 - y^2 - z^2 + 2x + 2y + 2z - 3 = 0$

C. $3x^2 - 3y^2 + z^2 - 4x - 6y - 8z - 29 = 0$

D. $3x^2 - 3y^2 + z^2 + 4x + 6y + 8z + 39 = 0$

Answer: B

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74. The locus of a point P from which the distance to the point (2,3,-1) is trible the distance from P to the xy - plane is

A. $x^2 + y^2 - 8z^2 - 4x - 6y + 2z + 14 = 0$

B. $x^2 + 3y^2 - z^2 - 4x - 2y + 8z - 3 = 0$

C. $x^2 - 3y^2 + z^2 + 4x - 6y + 8z - 29 = 0$

D. $x^2 + 3y^2 + z^2 + 4x + 6y + 8z + 29 = 0$

Answer: A

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75. The locus of a point P such that distances from P to the points (2,3,5), (1,2,-1) are in the ratio 5 : 2 is

A. $21x^2 + 21y^2 + 21z^2 - 34x - 76y + 90z - 2 = 0$

B. $21x^2 - 21y^2 + 21z^2 - 34x - 76y + 90z - 2 = 0$

C. $21x^2 + 21y^2 + 21z^2 - 34x + 76y + 90z + 2 = 0$

D. $21x^2 - 21y^2 - 21z^2 - 34x - 76y + 90z - 2 = 0$

Answer: A

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76. The locus of a point P such that 3PA = 2PB where A = (2,3,4) B=(-3,2,5) is

A. $5\left(x^2 + y^2 + + z^2\right) + 34x + 8y - 54z + 70 = 0$

B. $x^2 + y^2 + z^2 + 34x - 8y + 54 + 70 = 0$

C. $5\left(x^2+y^2++z^2\right)-60x-38y-32z+109=0$

D. $x^+y^2+z^2+34x-8y+54z-70=0$

Answer: C

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77. The locus of the point if the join of the points $(-4,2,3),(2,-1,5)$ subtends a right angle at P is

A. $x^2+y^2-z^2+2x-y-8z+5=0$

B. $x^2+y^2-z^2+2x-y-8z-5=0$

C. $x^2+y^2+z^2+2x-y-8z+5=0$

D. $x^2-y^2-z^2-2x-y-8z-5=0$

Answer: C

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78. The ends of the hypotenuse of a right angled triangle are $(2, 0, -3), (0, 4, 1)$ then the locus of the third vertex is

A. $x^2 + y^2 + z^2 - 2x - 4y + 2z - 3 = 0$

B. $x^2 + y^2 - z^2 - 2x + 4y + 2z + 3 = 0$

C. $x^2 - y^2 - z^2 - 2x - 4y + 2z - 3 = 0$

D. $x^2 + y^2 + z^2 + 2x + 4y + 2z + 3 = 0$

Answer: A

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79. The locus of the point P such that PA + PB = 4 where $A = (2, 3, 4), B = (-2, 3, 4)$ is

A. $y^2 + z^2 + 6y + 8z + 25 = 0$

B. $y^2 - z^2 + 6y + 8z - 25 = 0$

C. $y^2 + z^2 - 6y - 8z + 25 = 0$

D. $y^2 + z^2 - 6y - 8z - 25 = 0$

Answer: C

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80. The locus of point P such that PA - PB = 5 where $A = (3, 2, -1), B = (3, -4, 2)$ is

A. $25x^2 - 11y^2 + 16z^2 + 36yz - 150x - 40y + 20z + 325 = 0$

B. $25x^2 + 11y^2 - 16z^2 + 36yz - 150x - 40y + 20z + 325 = 0$

C. $25x^2 - 11y^2 + 16z^2 + 36yz - 150x + 40y - 20z - 325 = 0$

D. $25x^2 + 11y^2 + 16z^2 + 36yz - 150x + 40y + 20z + 325 = 0$

Answer: A

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81. The locus of the point P such that $PA^2 + PB^2 = 10$ where A=(2,3,4), B=(2,3,4) is

A. $x^2 + y^2 + z^2 - x + y - 4z + 12 = 0$

B. $x^2 + y^2 + z^2 - 5x + y - 6z + 24 = 0$

C. $2\left(x^2 + y^2 + z^2\right) - x + y - 4z + 12 = 0$

D. $x^2 + y^2 + z^2 - x - y - 4z - 12 = 0$

Answer: B

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82. The locus of the point P such that $PA^2 + PB^2 = 2PC^2$ where $A = (1, 3, 2), B = (2, 4, -3), C = (-2, 1, 3)$ is

A. $x^2 + y^2 + z^2 - x + y - 4z + 12 = 0$

B. $x^2 + y^2 + z^2 - 5x + y - 6z + 29 = 0$

C. $2\left(x^2 + y^2 + z^2\right) - x + y - 4z + 12 = 0$

D. $14x + 10y - 14z - 15 = 0$

Answer: D

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83. The locus of the point $(r\cos\alpha\cos\beta, r\cos\alpha\sin\beta, r\sin\alpha)$ is

A. $x^2 - y^2 - z^2 = r^2$

B. $x^2 + y^2 + z^2 = r^2$

C. $x^2 + y^2 - z^2 = r^2$

D. $x^2 - y^2 + z^2 = r^2$

Answer: B

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84. The locus of the point $(2\sec\alpha\cos\beta, 2\sec\alpha\sin\beta, 2\tan\alpha)$ is

A. $x^2 + y^2 - z^2 = 4$

B. $x^2 + y^2 + z^2 = 4$

C. $x^2 + y^2 - z^2 = r^2$

D. $x^2 - y^2 + z^2 = r^2$

Answer: A

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85. The coordinates of the point (3,-7,5) in the new system when the origin is shifted to $(-1, -1, -1)$ is

A. (4,-6,6)

B. (4,6,6)

C. (6,6,6)

D. (4,4,4)

Answer: A

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86. The transformed equation of $2x^2 + 3y^2 - z^2 - 8x + 18y + 2z + 9 = 0$ when the axes are translated to the point (2,-3,1) is

A. $2X^2 + 3Y^2 - Z^2 = 25$

B. $2X^2 + 3Y^2 + Z^2 = 25$

C. $2X^2 - 3Y^2 - Z^2 = 25$

D. $2X^2 + 3Y^2 - Z^2 = 50$

Answer: A

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87. The point to which the axes should be translated to eliminate first degree terms in the equation $2x^2 - 2y^2 + z^2 - 4x + 8y + 2z - 5 = 0$ is

A. (1,2,1)

B. (1,2,-1)

C. (-1,2,1)

D. (1,-2,1)

Answer: B

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Exercise 2 Special Type Questions Set 1

1. I : The points (-2,3,5), (1,,2,3),(7,0,-1) are collinear.

II: The points (2 ,-1,1) (1-3-5), (3,-4,-4) form an equilateral triangle.

A. only I is true

B. only II is true

C. both I and II are true

D. neither I nor II are true

Answer: A

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2. I: The ratio in which xy-plane divides the line segment joining (3,-2,2), (6,-17,-4) is 1: 4 externally

T II : The ratio in which xy-plane divides the line segment joining (2,4,5), (3,5,-4) is 5: 4

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3. A (3,4,5),B (2,3,1),C(-1,6,1) are the vertices of a triangle then

I: The circumcenter of triangle ABC is (1,5,3)

II: the orthocenter of triangle ABC is (2,3,1)

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Exercise 2 Special Type Questions Set 2

1. The descending order of the distances between the points

A) (0,0,0) , (cos , sin ,1) B) (1,2,3) , (-1,2,3) C) (0,0,0) , (3,4,0) D) (1,2,3),(2,3,1)

A. A,B,C,D

B. C,D,B,A

C. C,B,D,A

D. B,C,D,A

Answer: B

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2. In ΔABC, A(4,5,6), B(3,2,1), C(5,4,3). If p,q,r are lengths of the medians through A,B,C then increasing order of p,q, r is

A. p,q,r

B. q,p,r

C. r,p,q

D. r,q,p

Answer: B

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3. A(0,2,3), B(2,-1,5),C(3,0, -3) are vertices of ΔABC. If a,b,c are HG, GS, SH then their increasing order is (H,G, S are orthocentre, centroid and circumcentre)

A. a,b,c

B. c,b,a

C. b,a,c

D. b,c,a

Answer: C

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Exercise 2 Special Type Questions Set 3

1. Match the following

I.	The distance of the point (7,-8,15) from the x - axis is	a) 5
II.	The distance of the point (-5,2,12) from the y - axis is	b) 13
III.	The distance of the point (3,-4,5) from the z - axis is	c) 17

A. b , c, a

B. c , a , b

C. c , b , a

D. a , b, c

Answer: C

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2. Match the following

	Given points	Triangle formed
I.	$(1,2,3),(2,3,1),(3,1,2)$	a) equilateral triangle
I.	$(0,7,10),(-1,6,6),(-4,9,6)$	b) isosceles triangle
III.	$(1,1,1),(1,2,3),(2,-1,1)$	c) right angled triangle
IV.	$(1,2,3),(3,-1,5),(4,0,-3)$	d) right angled isosceles triangle

A. d , a , b , a

B. a , b , c , d

C. d , c , b , a

D. a , d , b , c

Answer: D

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3. Match the following

I.	The points $(3,2,1),(5,6,5),(2,1,2),(0,-3,-2)$ form	a) square
II.	The points $(1,2,2),(2,-1,0),(1,1,3),(0,4,5)$form	b) rectangle
III.	The points $(1,2,4),(-2,2,1),(2,4,-3),(5,4,0)$ form	c) rhombus
IV.	The points $(-2,4,1),(-1,5,5),(2,2,5),(1,1,1)$form	d) parallelogram

A. d, a , b ,c

B. a , b, c, d

C. d, c , b ,a

D. a , c, d , b

Answer: C

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4. Match the following

I.	Centroid of the triangle formed by $(2,3,-1),(5,6,3),(2,-3,1)$	a)(1,
II.	Circumcentre of the triangle formed by $(1,2,3),(2,3,1),(3,1,2)$	b) (3
III.	Orthocentre of the triangle formed by $(2,1,5),(3,2,3),(4,0,4)$	c)(2,
IV.	Incentre of the triangle formed by $(0,0,0),(3,0,0),(0,4,0)$	d)(3,

A. d, a , b ,c

B. a,b,c,d

C. d,c,b,a

D. a,c,d,b

Answer: C

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Exercise 2 Special Type Questions Set 4

1. A: The distance of the (1,2,3) from the coordinate axes are $\sqrt{13}, \sqrt{10}, \sqrt{5}$

R : The distance of P (x,y,z) from the coordinate are $\sqrt{y^2+z^2}, \sqrt{x^2+z^2}, \sqrt{x^2+y^2}$

A. both A and R are true and R is the correct explanation of A

B. both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A

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2. A : If $(2, 1, -3), (-2, 3, 4), (1, 2, 2)$ are the midpoints of $\overline{BC}, \overline{CA}, \overline{AB}$ of ΔABC then $A = (-3, 4, 9)$

R : If $(\alpha_1, \beta_1, \gamma_1), (\alpha_2, \beta_2, \gamma_2), (\alpha_3, \beta_3, \gamma_3)$ are the midpoints of the sides $\overline{BC}, \overline{CA}, \overline{AB}$ of ΔABC then $A = (\alpha_2 + \alpha_3 - \alpha_1, \beta_2 + \beta_3 - \beta_1, \gamma_2 + \gamma_3 - \gamma_1)$

A. both A and R are true and R is the correct explanation of A

B. both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A

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3. Assertion (A) : P(3,5,4), Q(6,5,7) are the vertice of a triangle whose orthocentre is (5,7,5)

Reason (R) : In a right angled triangle right vertex is orthocentre

A. both A and R are true and R is the correct explanation of A

B. both A and R are true but R is not the correct explanation of A

C. A is true but R is false

D. A is false but R is true

Answer: A

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