MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

COORDINATE GEOMETRY

Others

1. The three vertices of a parallelogram taken in order are $-1, 0), (3, 1) and (2, 2)$ respectively. Find the coordinates of the fourth vertex.

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2. Determine the ratio in which the line $3x + y - 9 = 0$ divides the segment joining the points (1,3) and (2,7) : (A) 1:2 (B) 2:3 (C) 3:4 (D) 4:5

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3. The coordinates of one end point of a diameter of a circle are $(4, -1)$ and the coordinates of the centre of the circle are $(1, -3)$. Find the coordinates of the other end of the diameter.

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4. If $A(5, -1), B(-3, -2) and (-1, 8)$ are the vertices of triangle ABC, find the length of median through A and the coordinates of the centroid.

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5. Of $A(-2, -1), B(a, 0), C(4, b)$ and $D(1, 2)$ are the vertices of a parallelogram, find the values of a and b.

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6. if the coordinates of the mid points of the Sides of a triangle are $(1, 2), (0, -1)$ and $(2, -1)$.Find the coordinates of its vertices `:

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7. $A(3, 2) and B(-2, 1)$ are two vertices of a triangle ABC whose centroid G has the coordinates $\left(\frac{5}{3}, -\frac{1}{3}\right)$. Find the coordinates of the third vertex C of the triangle.

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8. Prove that the area of triangle whose vertices are $(t, t-2), (t+2, t+2) and t+3, t)$ is independent of t.

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9. For what value of k are the points $(k, 2-2k)(-k+1, 2k) and (-4-k, 6-2k)$ are collinear?

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10. If the points $P, Q(x, 7), R, S(6, y)$ in this order divide the line segment joining $A(2, p) and B(7, 10)$ in 5 equal parts, find $x, y and p$.

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11. If $A(2, 2), B(-4, -4) and C(5, -8)$ are the vertices of a triangle, then the lengthof the median through vertex C is.

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12. The midpoint P of the line segment joining the points A(-10, 4) and B(-2, 0) lies on the line segment joining the points C(-9, -4) and D(-4, y).

Find the ratio in which P divides CD. Also find the value of y.

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13. If $R(x, y)$ is a point on the line segment joining the points $P(a, b) and Q(b, a),$ then prove that $x + y = a + b$

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14. If the points $A(-1, -4), B(b, c) and C(5, -1)$ are collinear and $2b + c = 4,$ find the values of b and c

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15. The perimeter of a triangle with vertices $(0, 4) and (0, 0) and (3, 0)$ is $7 + \sqrt{5}$ (b) 5 (c) 10 (d) 12

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16. A point P divides the line segment joining the points $A(3, -5) and B(-4, 8)$ such that $\frac{AP}{PB} = \frac{k}{1}$. If P lies on the line $x + y = 0$, then find the value of k.

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17. If G be the centroid of a triangle ABC, prove that, $AB^2 + BC^2 + CA^2 = 3(GA^2 + GB^2 + GC^2)$

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18. If $A(-3, 5), B(-2, -7), C(1, -8) and D(6, 3)$ are the vertices of a quadrilateral ABCD find its area.

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19. If the area of ABC formed by $A(x, y), B(1, 2) and C(2, 1)$ is 6 squae units, then prove that $x + y = 15$

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20. Show that the points $(a, a), (-a, -a)$ and $\left(-\sqrt{3}a, \sqrt{3}a\right)$ are the vertices of an equilateral triangle. Also, find its area.

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21. The x-coordinate of a point P is twice its y-coordinate. If P is equidistant from $Q(2, -5) and R(-3, 6)$, then find the coordinates of P.

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22. If $A(4, -6), B(3, -2) and C(5, 2)$ are the vertices of ABC, then verify the fact that a median of a triangle ABC divides it into two triangles of equal areas.

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23. Three vertices of a parallelogram ABCD are $A(3, -4), B(-1, -3) and C(-6, 2)$. Find the coordinates of vertiex D and find the area of parallelogram ABCD.

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24. The base PQ of two equilateral triangles PQR and PQR' with side 2a lies along y-axis such that the mid-point of PQ is at the origin. Find the coordinates of the vertices R and R' of the triangles.

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25. Let ABCD be a square of side 2a. Find the coordinates of the vertices of this square when (i) A coincides with the origin and AB and AD are along OX and OY respectively. (ii) The centre of the square is at the origin and coordinate axes are parallel to the sides AB and AD respectively

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26. Find the coordinates of the vertices of an equilateral triangle of side 2a as shown in Figure.

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27. The area of the triangle formed by $(a, b+c), (b, c+a) and (c, a+b)$ is (a) $a+b+c$ (b) abc (c) $(a+b+c)^2$ (d) 0

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28. If the points $A(4, 3) and B(x, 5)$ are on the circle with centre $O(2, 3)$, find the value of x.

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29. Find the equation of the perpendicular bisector of AB, where A and B are the points (3,6) and $(-3, 4)$ respectively. Also, find its points of intersection with (i) x-axis (ii) y-axis.

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30. If the point (x, y) is equidistant from the points $(a + b, b - a)$ and $(a - b, a + b)$, prove that $bx = ay$

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31. Find the distance between the points: $P(-6, 7)$ and$Q(-1, -5)$

$R(a+b, a-b)$ and $S(a-b-b)$ $A(at12, 2at_1)$ and $B(at22, 2at_2)$

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32. Find the angle subtended at the origin by the line segment whose end points are (0, 100) and (10 ,0)

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33. Prove that the points $(2, 3), (-4, -6) and \left(1, \frac{3}{2}\right)$ do not form a triangle.

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34. Show that the points $(-3, 2), (-5, -5), (2, -3)$ and $(4, 4)$ are the vertices of a rhombus. Find the area of this rhombus.

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35. Q.7 The two opposite vertices of a square are (l.-6)and (5,4). Find the coordinates of the other two vertices.

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36. In an A.P,the sum of m terms of an AP is n and sum of n terms of AP is m,then prove that sum of (m+n) terms of AP is-(m+n)

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37. In the seating arrangement of desks in a classroom three studens Rohini, Sandhya and Bina are seated at $A(3,1), B(6,4) and C(8,6)$. Do you think they are seated in al line?

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38. Find the coordinates of points which trisect the line segment joining $(1, -2) and (-3, 4)$.

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39. If the point $P(2, 2)$ is equidistant from the points $A(-2, k) and B(-2k, -3)$, find k. Also, find the length of AP.

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40. In what ratio does the point $C\left(\frac{3}{5}, \frac{11}{5}\right)$ divide the line segment joining the points $A(3, 5) and B(-3, -2)$?

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41. Find the ratio in which [the line segment joining $A(1, \ 5) \ and \ B(4, \ 5)$ is divided by the xaxis. Also find the coordinates of the point of division.

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42. If $a \neq b \neq c$, prove that the points $(a, a^2), (b, b^2), (c, c^2)$ can never be collinear.

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43. A point A divides the join of $P(-5, 1)$ and $Q(3, 5)$ in the ratio $k:1$. Then the integral value of k for which the area of ABC, where B is $(1, 5)$ and C is $(7, -2)$, is equal to 2 units in magnitude is___

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44. Prove that the mid-point of the hypotenuse of right angled triangle is equidistant from its vertices.

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45. Show that the points $(1, -1), (5, 2)$ and $(9, 5)$ are collinear.

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46. Prove that the diagonals of a rectangle bisect each other and are equal.

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47. Using analytical geometry, prove that the diagonals of a rhombus are perpendicular to each other.

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48. Find the area of the triangle whose vertices are

$(i)\ (2, 3), \ (-1, 0), \ (2, \ -4)$ $(ii)(-5, -1), \ (3, -5), \ ($

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49. If the vertices of a triangle have rational coordinates, then prove that the triangle cannot be equilateral.

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50. Find the area of the triangle ABC with $A(1, -4)$ and mid-points of sides through A being $(2, -1) and (0, -1)$.

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51. If $P(x, y)$ is any point on the line joining the point $A(a, 0) and B(0, b)$, then show that $\frac{x}{a} + \frac{y}{b} = 1$.

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52. If the line segment joining the points $(3, -4), and (1, 2)$ is trisected at points $P(a, -2) and Q\left(\frac{5}{3}, b\right)$. Then, $a = \frac{8}{3}, b = \frac{2}{3}$ (b)

$a = \frac{7}{3}, b = 0\ a = \frac{1}{3}, b = 1$ (d) $a = \frac{2}{3}, b = \frac{1}{3}$

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53. If the point $(x, 4)$ lies on a circle whose centre is at the origin and radius is 5, then $x = \pm 5$ (b) ± 3 (c) 0 (d) 14

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54. If three points $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ lie on the same line, prove that $\frac{y_1 - y_3}{x_2 x_3} + \frac{y_3 - y_1}{x_3 x_1} + \frac{y_1 - y_2}{x_1 x_2} = 0$

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55. If G be the centroid of a triangle ABC and P be any other point in the plane prove that $PA^2 + PB^2 + PC^2 = GA^2 + GB^2 + GC^2 + 3GP^2$

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56. The distance between the points $(a\cos\theta + b\sin\theta, 0) and (0, a\sin\theta - b\cos\theta)$ is $a^2 + b^2$ (b) $a + b\ a^2 - b^2$ (d) $\sqrt{a^2 + b^2}$

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57. Two vertices of a triangle are $(3, -5) and (-7, 4)$. If its centroid is $(2, -1)$, find the third vertiex.

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58. If $A(5, 2), B(2, -2) and C(-2, t)$ are the vertices of right angles triangle with $\angle B = 90^0$, then find the value of t.

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59. The length of a line segment is of 10 units and the coordinates of one end-point are $(2, -3)$. If the abscissa of the other end is 10, find the ordinate of the other end.

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60. Find the coordinates of the circumcentre of the triangle whose vertices are $(6, 6), (8, -2)$ and $(2, 2)$ Also, find its circum-radius.

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61. Let the opposite angular points of a square be $(3, 4) and (1, -1)$. Find the coordinates of the remaining angular points.

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62. Show that $A(6, 4), B(5, -2)$ and $C(7, -2)$ are the vertices of an isosceles triangle. Also, find the length of the median through A.

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63. Points $A(-1, y)$ and $B(5, 7)$ lie on a circle with centre $O(2, -3y)$. Find the values of y. Hence, find the radius of the circle.

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64. Show that the points $(1, -1), (5, 2)$ and $(9, 5)$ are collinear.

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65. Show that four points $(0, -1), (6, 7), (-2, 3) and (8, 3)$ are the vertices of a rectangle. Also, find its area.

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66. If P and Q are two points whose coordinates are $(at^2, 2at) and \left(\frac{a}{t^2}, \frac{2a}{t}\right)$ respectively and S is the point (a,0). Show that $\frac{1}{SP} + \frac{1}{sQ}$ is independent of t.

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67. If the two vertices of an equilateral triangle be $(0, 0), \left(3, \sqrt{3}\right),$ find the third vertex.

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

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69. If a vertex of a triangle be $(1,\ 1)$ and the middle points of the sides through it be $(-2,\ 3)$ and $(5,\ 2)$, find the other vertices.

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70. $A(4,\ 2)$, $B(6, 5)$ and $C(1,\ 4)$ are the vertices of ABC. Find the coordinates of the points Q on median BE such that $BQ : QE = 2 : 1$

A. Q=$\left(\frac{11}{3}, \frac{11}{3}\right)$

B. Q=$\left(\frac{10}{3}, \frac{11}{3}\right)$

C. Q=$\left(\frac{11}{3}, \frac{10}{3}\right)$

D. Q=$\left(\frac{10}{3}, \frac{10}{3}\right)$

Answer: A

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