



MATHS

BOOKS - CALCUTTA BOOK HOUSE

MATHS (BENGALI ENGLISH)

SECTION FORMULAS

Examples

1. The coordinates of the mid-point of the line segment joining the points $(l, 2m)$ and $(-l + 2m,$

$2l - 2m$) are

A. (l, m)

B. $(l, -m)$

C. $(m, -l)$

D. (m, l)

Answer:



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2. If the two end points of the diameter of a circle be $(7, 9)$ and $(-1, -3)$, then the centre of the circle is

A. $(3, 3)$

B. $(4, 6)$

C. $(3, -3)$

D. $(4, -6)$

Answer:



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3. If any points divides the line segment joining the points $(2, -5)$ and $(-3, -2)$ into the ratio $4 : 3$ externally. Then the ordinate of the point is

A. -18

B. -7

C. 18

D. 7

Answer:



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4. If P (1, 2), Q (4, 6), R (5, 7) and S (x, y) are the successive four vertices of the parallelogram PQRS, then

A. $x = 2, y = 4$

B. $x = 3, y = 4$

C. $x = 2, y = 3$

D. $x = 2, y = 5$

Answer:



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5. C is the centre of a circle and AB is its a diameter. The corrdination of A and C are (6, -7) and (5, -2) respectively. Find the coordinates of B.



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6. The points P and Q are on the first and third quadrant respectively and the distances of them from the x-axis and y-axis are 6 units and

4 units respectively. Find the coordinates of mid-point \overline{PQ} .



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7. The points A and B lie on the second and fourth quadrant respectively and the distances of them from the x-axis and y-axis are 8 units and 6 units respectively. Find the coordinates of mid-point of AB.



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8. P is a point on the line segment \overline{AB} such that $AP = PB$. If the coordinates of A and B are (3, -4) and (-5, 2) respectively find the coordinates of P.



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9. Determine the ratio in which the x-axis divides the line segment joining the points (5, -4) and (2, 3).



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10. Determine the ratio into which the line segment joining the points $(-1, 2)$ and $(4, -5)$ are intersected at the point $(-11, 16)$.



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11. The coordinates of P of the ΔPQR are $(-1, -1)$, if the centroid of the triangle be $\left(2, \frac{4}{3}\right)$, then find the mid-point of QR.



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12. $(2, 6)$ is the centre of a circle and one of its chords of length of length 24 units is bisected at $(-1, 2)$. Find the radius of the circle.



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13. Determine the ratio in which the line segment joining the points $(7, 3)$ and $(-9, 6)$ is divided by the y-axis.



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14. Prove that the point A (7, 3), B (9, 6), C (10, 12) and D(8, 9) when joined consecutively produce a parallelogram.



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15. Find (x, y) if the points (3, 2), (6, 3), (x, y) and (6, 5) produce a parallelogram when joined successively.



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16. If the points (x_1, y_1) , (x_2, y_2) , (x_3, y_3) and (x_4, y_4) when joined successively produce a parallelogram, prove that

$$x_1 + x_3 = x_2 + x_4 \text{ and } y_1 + y_3 = y_2 + y_4.$$



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17. $(2, -4)$, $(6, -2)$ and $(-4, 2)$ are the vertices of a triangle. Find the length of its medians.



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18. Find the coordinates of the midpoint of the line segment intersected by the axes of the straight line $4x + 3y + 12 = 0$.



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19. Determine the ratio in which the straight line $3x + 4y = 21$ divides the line segment obtained by joining the points $(-9, 5)$ and $(7, 9)$.



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20. If the points $(5, 2)$, $(x, 7)$, $(-1, 4)$ and $(1, y)$ after joining successively produce a parallelogram, find the values of x and y .



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Exercise 2

1. The coordinates of the mid-point of the line segment obtained by joining the points (l, m) and $(l + m, l - m)$ are

A. $\left(m + \frac{l}{2}, \frac{m}{2}\right)$

B. (m, l)

C. $\left(m + \frac{l}{2}, l + \frac{m}{2}\right)$

D. $\left(l + \frac{m}{2}, \frac{l}{2}\right)$

Answer:



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2. The coordinates of the point which divides internally the line segment obtained by

joining the points $(8, 9)$ and $(-7, 4)$ into the ratio $2 : 3$ are

A. $(7, 2)$

B. $(2, 7)$

C. $(-7, 2)$

D. $(2, -7)$

Answer:



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3. The coordinates of the point which divides externally the line segment obtained by joining the points $(2, -5)$ and $(-3, -2)$ into the ratio $4 : 3$ are

A. $(18, 7)$

B. $(18, -7)$

C. $(-18, 7)$

D. $(7, -18)$

Answer:



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4. The two end points of the diameter of a circle are $(7, 9)$ and $(-1, -3)$. Then the centre of the circle is

A. $(2, 3)$

B. $(3, 3)$

C. $(3, 2)$

D. None of these

Answer:





5. The point of intersection of the medians of a triangle with vertices $(8, 4)$, $(5, 7)$ and $(-1, -2)$ is

A. $(3, 4)$

B. $(4, 3)$

C. $(2, 3)$

D. $(3, 2)$

Answer:



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6. $(4, -3)$, $(-5, 2)$ and (x, y) are the three vertices of a triangle. If the centroid of the triangle be the origin, find the values of x and y .



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7. Determine the ratio into which the y -axis divides the line segment obtained by joining the points $(-3, 2)$ and $(6, 1)$.





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8. Find the ratio into which the line segment obtained by joining the points $(-1, 2)$ and $(4, -5)$ is divided at $(-11, 16)$.



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9. $(1, -2)$ and $(-2, 3)$ are the points A and B of the $\triangle ABC$. If the centroid of the triangle be at the origin, then find the coordinates of C .



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10. The coordinates of three consecutive vertices of a parallelogram are $(4, 3)$, $(6, 7)$ and $(9, 10)$. Find the coordinates of fourth vertex.



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11. The sides of the rectangle ABCD are parallel to the axes. If the coordinates of A and C are $(12, 3)$ and $(7, 6)$ respectively, find the coordinates of D.



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12. P(1, 4), Q(3, -9) and R(-5, 2) are the vertices of a triangle. Find the length of the median passing through Q.



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13. Find the coordinates of the point at which the line segment obtained by joining the points $(x + y, x - y)$ and $(x - y, x + y)$ is divided into the ratio $x : y$ internally.



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14. Find the coordinates of the point at which the line segment obtained by joining the points (a, b) and (b, a) is divided externally into the ratio $(a - b) : (a + b)$.



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15. Find the ratio into which the line segment obtained by joining the points $(-3, 8)$ and $(7, -7)$

at the point $(1, 2)$.



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16. Find the ratio into which the line segment obtained by joining the points $(4, 7)$ and $(1, -2)$ at a point $(-5, -20)$.



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17. Determine the ratio into which the line segment obtained by joining the points $(3, 4)$

and $(2, -3)$ by the x -axis. Also find the ratio into which same line is divided by the y -axis.



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18. If the points $(3, 2)$, $(6, 3)$, (x, y) and $(6, 5)$ when joined successively produce a parallelogram then find (x, y) .



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19. $(2, 1)$, $(5, 4)$ and $(1, 4)$ are three vertices of a parallelogram. Find the coordinates of the vertex opposite to $(2, 1)$.



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20. $A(-3, 5)$ and $B(1, 7)$ are two consecutive vertices of a parallelogram. If the point of intersection of its diagonals be $(1, 1)$, then find its other two vertices.



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21. P is a point on \overline{AB} such that $\overline{AP} = 3\overline{PB}$. If the coordinates of A and B be (3, -4) and (-5, 2) respectively, find P.



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22. The sides of a rectangle are 20 units and 10 units respectively and are parallel to the coordinate axes. If the point of intersection of its diagonals be (4, -2), then find the four vertices of the rectangle.



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23. P (2, -5), Q(1, -2) and R(4, 7) are the vertices of a triangle. Find the coordinates of the point of intersection of its side PR and the bisector of the angle Q.



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24. Find the ratio into which the line segment obtained by joining the points (4, 5) and (7, -1)

is divided by the straight line $5x + 4y = 4$.



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25. The straight line $4x + 3y - 12 = 0$ intersects the x -and y-axis A and B respectively. Find the coordinates of the point at which the straight line \overline{AB} is divided internally into the ratio 2 : 1.



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26. If the points $P(a, 1)$, $Q(1, b)$, $R(-2, 11)$ are collinear and Q be the mid - point of \overline{PR} , then find the value of a and b .



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27. If one of the vertices and the centroid of a triangle be $(1, 2)$ and $(1, 1)$ respectively, then find the coordinates of the mid-point of the opposite side of its given vertex.



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28. P and Q are such two points on the line segment obtained by joining the points A (-2, 5) and B (3, 1) that $AP = PQ = QB$. Then find the coordinates of the mid-point of PQ.



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29. Find the coordinates of the vertices of a triangle of which D (2, -1), E (-1, 4) and F(-2, 2) are the mid-points of its sides.



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30. If $(2, 0)$, $(4, 4)$ and $(6, 2)$ are the vertices of the triangle ABC, then find the lengths of its medians.



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