MATHS

BOOKS - CALCUTTA BOOK HOUSE

MATHS (BENGALI ENGLISH)

AREA OF TRIANGLES

Examples Select The Correct Answer Mcq

1. In the right-angled triangle $ABC, \angle ABC = 90^\circ$. If the coordinates of A

and C be (0,4) and (3,0) respectively then the area of the ΔABC is

A. 12 Sq-units

B. 6 Sq-units

C. 24 Sq-units

D. 8 Sq-units

Answer:

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2. If the points (0,0), (4,-3) and (x,y) are collinear, then

A. $x = 8, y = -6$

B. $x = 8, y = 6$

C. $x = 4, y = -6$

D. $x = -8, y = -6$

Answer:

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3. If the points (-1,3), (2,h) and (5,-1) are collinear, then the value of h is

A. 1

B. 0

C. 2

D. none of these

Answer:

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Examples Short Answer Type Question

1. Examine whether the points (2,3), (4,5) and (6,5) are collinear or not.

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2. The centroid of a triangle is (6,9) and two of its vertices are (15,0) and (0,10). Find the coordinates of the third vertex.

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3. If the points (a,0), (0,b) and (1,1) are collinear, then show that $\frac{1}{a}+\frac{1}{b}=1$.

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4. Find the centroid of the triangle formed by the points (x-y,y-z), -x,-y) and (y,z)

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Long Answer Type Questions

1. For what value of k the points (1,-1), (2,-1) and (k,-1) are collinear ?

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2. Prove that the line segment obtained by joining the points (1,2) and (-2,-4) passes through the origin.

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3. Prove that the mid-point of the line segment obtained by joining the points (2,1) and (6,5) lie on the line segment obtained by joining the points (-4,-5) and (9,8).

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4. Find the area of the quadrilateral formed by the points (1,4), (-2,1), (2,-3) and (3,3).

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5. The coordinates of A, B and C are (3,4), (-4,3) and (8,-6) respectively , Find the area of the ΔABC and also find the perpendicular distance of BC from the vertex A.

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6. The coordinates of A of the ΔABC are (2,5) and the coordinates of its centroid are (-2,1). Find the coordinates of the mid-point of BC.

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7. A (-1,5), B (3,1) and C (5,7) are the vertices of the ΔABC. D,E and F are the midpoint of BC, CA and AB respectively. Find the area of ΔDEF and show that $\Delta ABC = 4\Delta DEF$.

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8. The coordinates of the points A,B,C,D are (0,-1),(-1,2),(15,2) and (4,-5) respectively . Find the ratio in which $\overline{AC}$ divides $\overline{BD}$.

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9. The vertices of the triangle ABC are A (3,0), B (0,6) and C (0,6). The sides $\overline{AB}$ and $\overline{AC}$ of ΔABC are intersected by $\overline{DE}$ at D and E respectively into a ratio of $1:2$. Prove by coordinate geometry that $\Delta ABC = 9\Delta ADE$.

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10. Find the area of the triangle with vertices at $\left(a, \frac{1}{a}\right), \left(b, \frac{1}{b}\right)$ and $\left(c, \frac{1}{c}\right)$.

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11. Locate the number 1.4 on the number line by the method of successive magnification.

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12. The coordinates of A, B and C of the ΔABC are (3,1), (9,7) and (-3,7) respectively. If D, E and F are the mid-points to the sides $\overline{BC}, \overline{CA}$ and $\overline{AB}$ respectively, then find the

are of the ΔDEF. Also show that $\Delta ABC = 4\Delta DEF$.

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13. If the coordinates of A, B, C and D are (6,3), (-3,5), (4,-2) and (x,3x) respectively and if $\frac{\Delta DBC}{\Delta ABC} = \frac{1}{2}$. then show that $x = \frac{11}{8}$ or $\frac{3}{8}$.

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14. If the point (a,b), (a',b') and (a-a',b-b') are collinear, then prove that ab' = a'b.

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15. Prove that (a,b + c), (b,a + c) and (c, a + b) are collinear.

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16. If P (-2,3), Q (4,-5) and R (-3,1) are the three consecutive vertices of a parallelogram, then find its area.

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17. Four vertices of a quadrilateral are (-5,-5), (2,-4), (3,2) and (-2,3). Find the area of the quadrilateral.

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18. Four vertices of a quadrilateral are (1,2), (-5,6), (7,-4) and (k,-2) and its area is zero. Find the value of k.

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19. Four vertices of a quadrilateral are A (-1,6) B (-2.-4), C (3,-2) and D (a,b) respectively and its area is 28 Sq-units. Prove that $2a + b = 6$ or, $2a + b + 22 = 0$.

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Exercise 3 Select The Correct Answer Mcq

1. The straight lines 4x + 3y = 12 and 4x - 3y = 12 intersect the x-axis at A and B respectively. If the lengt of the perpendicular drawn from C to AB be 4 units, then area of the ΔABC is

A. 12 Sq-units

B. 6 Sq-units

C. 24 Sq-units

D. 18 Sq-units

Answer:

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2. The area of the triangle produced by the straight line 5x + 6y = 15 and the coordinate axes is

A. $\frac{15}{4}$ Sq-units

B. $\frac{25}{4}$ Sq-units

C. 15 Sq-units

D. 20 Sq-units

Answer:

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3. The area of the triangle with vertices A (5,2), B (-4,1) and C (0,-6) is

A. $\frac{57}{2}$ Sq-units

B. $\frac{67}{2}$ Sq-units

C. $\frac{37}{2}$ Sq-units

D. $\frac{77}{2}$ Sq-units

Answer:

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4. The centroid of a triangle is (6,4) and two of its vertices are (6,1) and (2,7). The third vertex of the triangle is

A. (10,4)

B. (10,-4)

C. (4,10)

D. (-4,10)

Answer:

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Exercise 3 Short Answer Type Question

1. Show that the line segment obtained by joining the points (5,6) and (-10,-12) passes through the origin.

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2. Prove that the points (-4,-5) ,(9,8)and the mid-point of the line-segment joining the point (2,1) and (6,5) are on the same straight line

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3. Find the area of the triangle with vertices $\left(at_1^2, 2at_2\right)$ and $\left(at_3^2, 2at_3\right)$.

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4. Prove that the points $(a, bc - a^2), (b, ca - b^2), (c, ab - c^2)$ are collinear.

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5. Prove that the points $(p, p^2), (q, q^2)$ and $(r, r^2)(p \neq r)$ can never be collinear.

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