



MATHS

BOOKS - CENGAGE

AREA OF A TRIANGLE

Test Yourself Level 1

1. Find the area of the triangle formed by the following points:

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



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2. Find the area of the triangle formed by the following points:

$(-2,4)$, $(10,-2)$, $(-2,3)$



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3. Find the area of the quadrilateral formed by the following

$(-1,6)$, $(-3,-9)$, $(5,-8)$, $(3,9)$



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4. Find the area of the quadrilateral formed by the following

$(6,2)$, $(10, 16)$, $(-12,6)$, $(-4,18)$



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5. Show that the following points lie on a straight line.

$(-1,6)$, $(-10,12)$, $(-16,+16)$



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6. Show that the following points lie on a straight line.

$(1,-1), (7,-4), (-5,2)$



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Test Yourself Level 2

1. The area of the quadrilateral whose vertices are $(1,1), (3,4), (5,-2)$ and $(4,-7)$ is

A. $20^{1/2} \text{ unit}^2$

B. $19^{1/2} \text{ unit}^2$

C. 19 unit^2

D. $17^{1/2} \text{ unit}^2$

Answer: A



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2. The vertices of a triangle are $A(0,0)$, $B(6,0)$, and $C(0,8)$. The area of the triangle formed by the mid-point of the sides of the triangle ABC as vertices is

A. 24 unit^2

B. 12 unit^2

C. 6 unit^2

D. 48 unit^2

Answer: C



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3. the area of the pentagon whose whose vertices are $(1,1)$, $(7,21)$, $(7,-3)$, $(12,2)$ and $(0,-3)$ is

A. 145

B. 146

C. 175

D. 176

Answer: B



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Test Yourself Level 3

1. Find the areas of the triangles if the coordinates of vertices are as follows:

$(a, b+c)$, $(a, b-c)$ and $(-a, c)$



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2. Find the areas of the triangles if the coordinates of vertices are as follows:

$(a, c+a)$, (a, c) and $(-a, c-a)$



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3. For what value of x are the points $(-3,12)$, $(7,6)$ and $(x,9)$ collinear?



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4. Find the relation between x and y if the point (x,y) lies on the straight line joining $(2,-3)$ and $(1,4)$



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5. If the area of the triangle formed by the points $(1,2)$, $(2,3)$ and $(x,4)$ is 40 square units, find x .



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6. Find the area of the triangle if the coordinates of vertices are as follow:

$$(am_1^2, 2am_1), (am_2^2, 2am_2), \text{ and } (am_3^2, 2am_3)$$

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7. Find the area of the triangle if the coordinates of vertices are as follow:

$$(am_1m_2, a(m_1 + m_2)), (am_2m_3, a(m_2 + m_3)), \text{ and } (am_3m_1, a(m_3 + m_1))$$

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8. Find the area of the triangle if the coordinates of vertices are as follow:

$$\left(am_1, \frac{a}{m_1}\right) \left(am_2, \frac{a}{m_2}\right), \text{ and } \left(am_3, \frac{a}{m_3}\right)$$

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9. For what value of y are points $(1,4), (3,y)$ and $(-3,16)$ collinear?

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10. Find the value of k for which the area formed by the triangle with vertices $(k,2k)$, $(-2,6)$ and $(3,1)$ is 5 square units.

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11. Find the area of the pentagon whose vertices are $A(4,3)$,
 $B(-5,6)$, $C(-7,2)$, $D(0,-7)$ and $E(3,-6)$

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12. Find the lengths of the altitudes of the triangle whose vertices are
 $A(1,3)$, $B(5,-6)$ and $C(7,-4)$,

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13. The area of quadrilateral ABCD with $A(1,1)$, $B(7,-3)$, $C(12,2)$ and $D(7,21)$ as its vertices is

- A. 35 sq. units
- B. 65 sq. units
- C. 132 sq. units
- D. 115 sq. units

Answer: C



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14. If the points $A(-2,3)$, $B(1,2)$ and $C(K,0)$ are collinear then $K=$

- A. 5
- B. 6
- C. 7
- D. 8

Answer: C



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15. If the points $A(x,-1)$, $B(2,1)$ and $C(4,5)$ are collinear then $x=$

A. 1

B. -2

C. -4

D. -5

Answer: A



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16. What is the area of the triangle having vertices $A(0,4)$, $B(3,6)$,and $C(-8,-2)$?

A. $a^2 + b^2$

B. a^2

C. b^2

D. $a^2 + b^2 + c^2$

Answer: B



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17. The area of triangle having vertices $A(a,b+c)$ $B(a,b,-c)$ and $C(-a,c)$ where $(a,b,c > 0)$, is

A. ac

B. $2ac$

C. $3ac$

D. $4ac$

Answer: B

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18. What is the area of triangle having angular points $A(a, c + a)$, $B(a, c)$ and $C(-a, c - a)$?

A. 1

B. 2

C. 3

D. 4

Answer: A

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19. The area of triangle having angular points $P(a\cos \theta_1, b\sin \theta_1)$, $Q(a\cos \theta_2, b\sin \theta_2)$ and $R(\cos \theta_3, b\sin \theta_3)$ is

A. $2ab \sin \frac{\theta_1 - \theta_2}{2} \sin \frac{\theta_2 - \theta_3}{2} \sin \frac{\theta_3 - \theta_1}{2}$

B. $2ab \sin (\theta_1 + \theta_2) \sin (\theta_2 + \theta_3) \sin (\theta_3 + \theta_1)$

C. $ab \sin \frac{\theta_1 - \theta_2}{2} \sin \frac{\theta_2 - \theta_3}{2} \sin \frac{\theta_3 - \theta_1}{2}$

D. none of these

Answer: A



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20. Area of triangle having angular points

$A[am_1m_2, (m_1 + m_2)]$, $B[am_2m_3, a(m_2 + m_3)]$ and

$C[am_3m_1, a(m_3 + m_1)]$ is

A. $(m_1 - m_2)(m_2 - m_3)(m_3 - m_1)$

B. $a^2(m_1 - m_2)(m_2 - m_3)(m_3 - m_1)$

C. $\frac{1}{2}a^2(m_1 - m_2)(m_2 - m_3)(m_3 - m_1)$

D. none of these

Answer: C



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21. The area of quadrilateral coordinates of whose angular points are $A(1,1)$, $B(3,4)$, $C(5,-2)$ and $D(4,-7)$ is

A. 20

B. $20\frac{1}{2}$

C. 21

D. $21\frac{1}{2}$

Answer: B



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22. The area of quadrilateral the coordinates of whose angular points , taken in order

A. 96

B. 48

C. 24

D. 12

Answer: A



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23. If $P\left(\frac{-1}{2}, 3\right)$, $Q(-5, 6)$ and $R(-8, 8)$ are given Point which of the following is correct?

A. Points form a triangle having non-zero area

B. Points lie on a circle

C. Points lie on a straight line

D. None of these

Answer: C



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Olympiad And Ntse Level Exercises

1. Area of triangle formed by the points $A(a, b + c)$, $B(b, c + a)$ and $C(c, a + b)$ depends upon

- A. a
- B. b
- C. c
- D. independent from a,b,and c

Answer: D



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2. Let $A(6,3), B(-3,5)$, $C(4,-2)$ and $D(x,3x)$ be four points, if the ratio area of $\triangle DBC$ and $\triangle ABC$ is 1 : 2 then the value of x is

A. $\frac{11}{8}$

B. $\frac{8}{11}$

C. 3

D. none of these

Answer: A

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3. If the points $(x + 1, 2)$, $(1, x + 2)$ and $\left(\frac{1}{x + 1}, \frac{2}{x + 1}\right)$ are collinear, then x is

A. 4

B. 0

C. -4

D. none of these

Answer: A



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4. The locus of P such that area of ΔPAB is 12 sq. units, where $A(2,3)$ and $B(-4,5)$ is

A. $(x+3y-1), (x+3y-23) = 0$

B. $(x+3y+1) (x+3y-23) = 0$

C. $(3x+ y-1), (3x+ y-23)=0$

D. $(3x+ y+1) (3x+ y+23)=0$

Answer: B



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5. If $A(1, p^2)$, $B(0, 1)$ and $C(p, 0)$ are the coordinates of three points then the value of p for which the area of the triangle ABC is minimum is

A. $\frac{1}{\sqrt{3}}$

B. $-\frac{1}{\sqrt{3}}$

C. $\frac{1}{\sqrt{3}}$ or $-\frac{1}{\sqrt{3}}$

D. none of these

Answer: D



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6. OPQR is a square with M and N as the middle points of the sides PQ and QR, respectively. The ratio of the areas of the square and the triangle OMN is

A. 4:1

B. 2:1

C. 8:3

D. 4:3

Answer: C



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7. Find the area of quadrilateral whose vertices are $(-4,5)$, $(0,7)$, $(5,-5)$ and $(-4,-2)$

A. $54\frac{1}{2}$ sq. units

B. $56\frac{1}{2}$ sq. units

C. $58\frac{1}{2}$ sq. units

D. $60\frac{1}{2}$ sq. units

Answer: D



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8. Four points $A(6,3)$, $B(-3,5)$, $C(4,-2)$ and $D(x,2x)$ are given in such a way

that $\frac{\text{Area of } \triangle DBC}{\text{Area of } \triangle ABC} = \frac{1}{2}$ The values of x is

A. $\frac{5}{6}$

B. $\frac{2}{3}$

C. $\frac{11}{6}$

D. $\frac{8}{3}$

Answer: C



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9. If area of $\triangle OPB =$ area of $\text{Tri}\angle OPA$ where O is origin, $A = (6, 0)$, $B = (0, 4)$ and P lies on line $x + y = 1$ then possible coordinates of P is/are

A. (1,2)

B. (-2, 3)

C. (3, -2)

D. (3, -1)

Answer: C



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10. The midpoints of the sides of triangle ABC are $(-1,-2)$, $(6,1)$ and $(3,5)$.

The are of ΔABC is

A. 72 sq. units

B. 73 sq. units

C. 74 sq. units

D. 75 sq. units

Answer: C



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