

IITJEE Foundation Practice paper

AREA OF PARALLELOGRAMS AND TRIANGLES AND HERONS FORMULA

class-9th-Mathematics Number of Questions: 65

For Answers and Solutions, Go to www.micromerits.com

1

For polygonal regions R_1 and R_2 , which among the following is true ?

- $R_1 \cong R_2 \implies ar(R_1) = ar(R_2)$ $R_1 \subseteq R_2 \implies ar(R_1) \leq ar(R_2)$
 $ar(R_1 \cup R_2) = ar(R_1) + ar(R_2)$ All the above

2

The diagonal of a parallelogram divides it into two triangles of _____ .

- equal area area of one equal to half of the other
 area of one equal to thrice the area of the other
 area of one equal to square of the area of the other

3

Parallelograms on the same base and between the same parallels are _____ .

- unequal in areas equal in area can't be determined

4

The diagonals of a parallelogram divides it into _____ triangles of _____ .

- four, areas of opposite triangles equal two, equal area four, equal area
 None of the above

5

If the medians of a $\triangle ABC$ intersect at G , then

- $ar(\triangle AGB) = ar(\triangle AGC) = ar(\triangle BGC) = ar(\triangle ABC)$
- $ar(\triangle AGB) = ar(\triangle AGC) = ar(\triangle BGC) = 2ar(\triangle ABC)$
- $ar(\triangle AGB) = ar(\triangle AGC) = ar(\triangle BGC) = 3ar(\triangle ABC)$
- $ar(\triangle AGB) = ar(\triangle AGC) = ar(\triangle BGC) = \frac{1}{3}ar(\triangle ABC)$

6

Two parallelograms are on equal bases and between the same parallels. The ratio of their areas is

- 1 : 2
- 2 : 1
- 1 : 1
- 1 : 3

7

If a triangle and a parallelogram are on the same base and between the same parallels, then the ratio of the area of the triangle to the area of the parallelogram is

- 1 : 3
- 1 : 2
- 2 : 3
- 1 : 4

8

The lengths of the diagonals of a rhombus are 18 cm and 22 cm. The area of the rhombus is

- 198 cm^2
- 396 cm^2
- 80 cm^2
- 160 cm^2

9

The area of a trapezium whose parallel sides are 11 cm and 17 cm respectively and the distance between these sides as 9 cm is

- 81 cm^2
- 126 cm^2
- 252 cm^2
- 74 cm^2

10

Two parallel sides of a trapezium are 17 cm and 25 cm long and the distance between them is 8.2 cm. The area of the trapezium is

- 172.2 cm^2
- 42 cm^2
- 344.4 cm^2
- 245 cm^2

11

The area of a rhombus is 126 cm^2 . If the length of one of its diagonals is 14 cm then the length of the other diagonal is

- 14 cm
- 12 cm
- 18 cm
- 16 cm

12

Which among the following is a CORRECT statement ?

- The union of a triangle and its interior is called the interior of the triangle.
- Any side of a parallelogram is called its altitude.
- A parallelogram and a rectangle on the same same base and between the same parallels are equal in area.
- If a triangle and a parallelogram are on the same base , and between the same parallels, then their areas are equal.

13

Which among the following is INCORRECT ?

- Area of a triangle = $\frac{1}{2} \times (\text{base} + \text{height})$
- Area of a parallelogram = base x height
- Area of a rhombus = $\frac{1}{2} \times \text{product of the diagonals}$
- None of the above

14

Area of a trapezium is

- $\frac{1}{2} \times (\text{sum of parallel sides} + \text{distance between them})$
- $\frac{1}{4} \times (\text{sum of parallel sides}) \times (\text{distance between them})$
- $\frac{1}{2} \times (\text{sum of parallel sides}) \times (\text{distance between them})$
- $\frac{1}{2} \times (\text{product of parallel sides}) \times (\text{distance between them})$

15

$PQRS$ is a quadrilateral whose diagonal PR divides it into two parts, equal in area, then $PQRS$ is a

- rhombus
- parallelogram
- rectangle
- All of these

16

The median of a triangle divides it into two

- right triangles
- congruent triangles
- isosceles triangles
- triangles of equal area

17

If the area of a parallelogram with one side as 21 cm is 273 cm^2 then

its height is

- 13 cm 15 cm 21 cm 23 cm

18

Area of a triangle with base 15 cm and height 10 cm is

- 25 cm^2 50 cm^2 75 cm^2 150 cm^2

19

Find the area of the $\triangle ABC$ whose base = 15 cm and height = 7 cm.

- 54 cm^2 105 cm^2 52.5 cm^2 63 cm^2

20

Find the area of the triangle whose sides are 42 cm, 34 cm and 20 cm in length. Hence find the height corresponding to the longest side.

- $336 \text{ cm}^2, 18 \text{ cm}$ $344 \text{ cm}^2, 16 \text{ cm}$ $336 \text{ cm}^2, 16 \text{ cm}$
 $362 \text{ cm}^2, 21 \text{ cm}$

21

The area of an equilateral triangle whose side is 12 cm is

- $12\sqrt{3} \text{ cm}^2$ $36\sqrt{3} \text{ cm}^2$ $144\sqrt{3} \text{ cm}^2$ $72\sqrt{3} \text{ cm}^2$

22

For an isosceles triangle having base b and each of the equal sides as a , we have:

- Perimeter = $(2a + b)$ Area = $\frac{b \cdot \sqrt{4a^2 - b^2}}{4}$ Height = $\frac{1}{2} \sqrt{4a^2 - b^2}$
 All of these

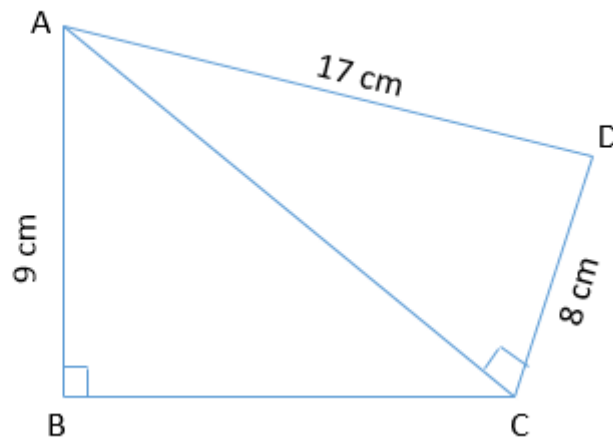
23

For an isosceles right-angled triangle having each of equal sides a , we have

- Hypotenuse = $\sqrt{2}a$ Perimeter = $(2 + \sqrt{2})a$ Area = $\frac{1}{2}a^2$
 All of these

24

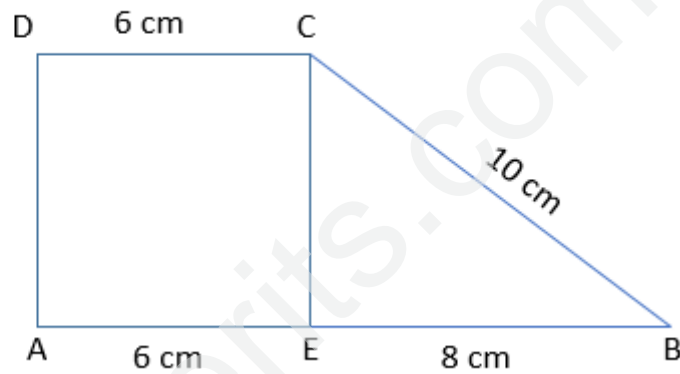
The area of quadrilateral ABCD in the given figure is



- 169 cm^2 128 cm^2 228 cm^2 114 cm^2 114 cm^2

25

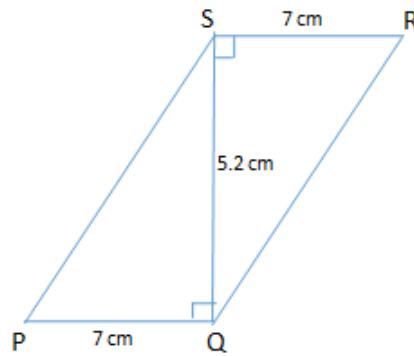
The area of trapezium ABCD in the given figure is



- 60 cm^2 60 cm^2 84 cm^2 123 cm^2 247 cm^2

26

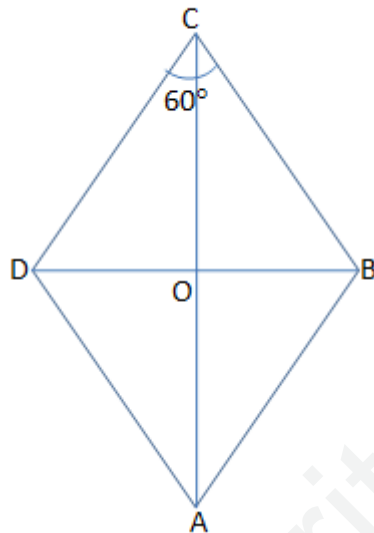
In the given figure PQRS is a parallelogram in which $PQ = RS = 7\text{ cm}$ and $QS \perp RS$ such that $QS = 5.2\text{ cm}$. Then, the area of the parallelogram PQRS is



- 35 cm^2
 40 cm^2
 36.4 cm^2
 36.4 cm^2
 72.8 cm^2

27

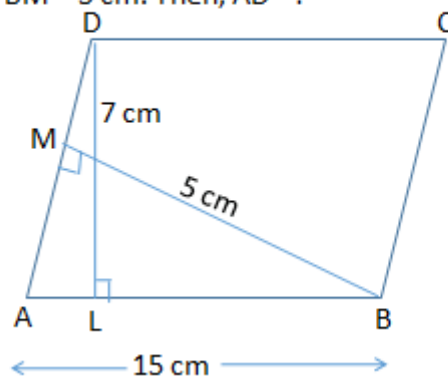
ABCD is a rhombus in which $\angle C = 60^\circ$. Then, $AC : BD = ?$



- $3 : 1$
 $\sqrt{3} : 1$
 $\sqrt{3} : 1$
 $2 : 3$
 $\sqrt{2} : \sqrt{3}$

28

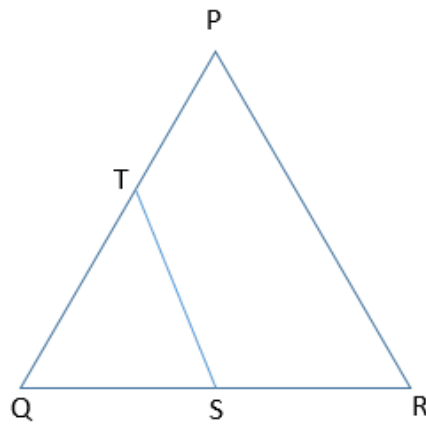
In parallelogram ABCD, it is given that $AB = 15\text{ cm}$, $DL \perp AB$ and $BM \perp AD$ such that $DL = 7\text{ cm}$ and $BM = 5\text{ cm}$. Then, $AD = ?$



- 7 cm
 105 cm
 15 cm
 21 cm
 21 cm

29

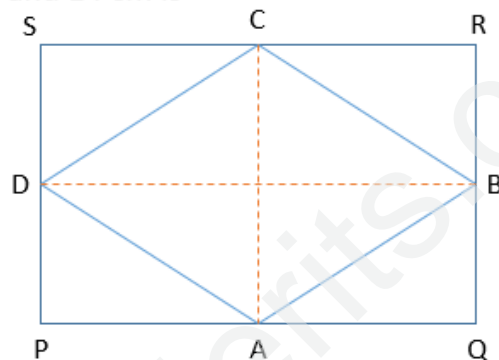
$\triangle PQR$ and $\triangle QST$ are two equilateral triangles such that S is the midpoint of QR . Then, $\text{ar}(\triangle QST) : \text{ar}(\triangle PQR) = ?$



- $\sqrt{3} : 4$ $4 : 1$ $3 : 2$ $1 : 4$ $1 : 4$

30

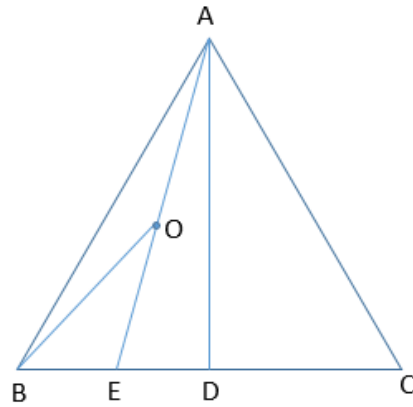
The figure formed by joining the midpoints of the adjacent sides of a rectangle of sides 9 cm and 14 cm is



- 126 cm^2 252 cm^2 63 cm^2 63 cm^2 78 cm^2

31

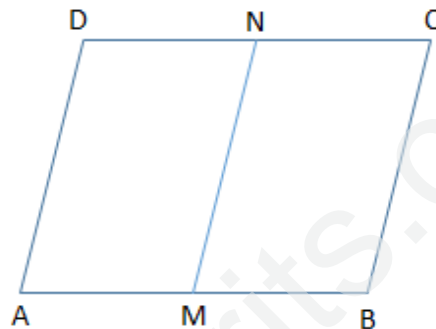
In $\triangle ABC$, it is given that D is the midpoint of BC; E is the midpoint of BD and O is the midpoint of AE. Then, $ar(\triangle BOE) = ?$



- $\frac{1}{4}ar(\triangle ABC)$
 $\frac{1}{2}ar(\triangle ABC)$
 $\frac{1}{6}ar(\triangle ABC)$
 $\frac{1}{8}ar(\triangle ABC)$
 $\frac{1}{8}ar(\triangle ABC)$

32

In a parallelogram ABCD, if M and N are the midpoints of AB and CD respectively and $ar(\parallel gm\ ABCD) = 28\text{ cm}^2$, then $ar(\parallel gm\ AMND) = ?$

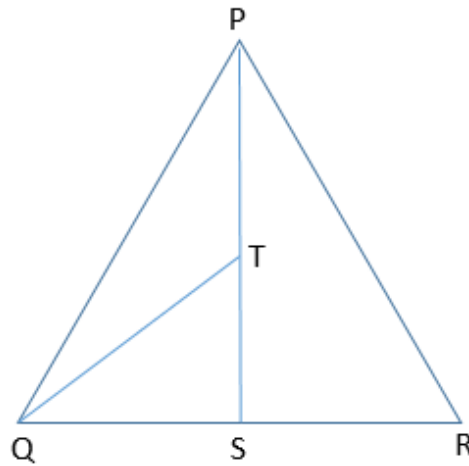


- 28 cm^2
 14 cm^2
 14 cm^2
 56 cm^2
 32 cm^2

33

Micromerits.com

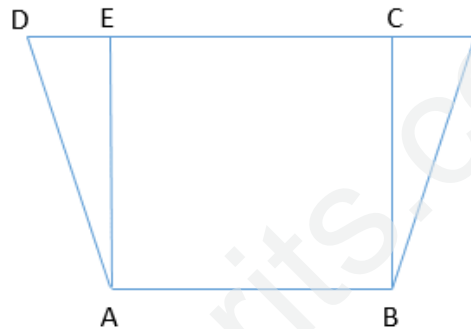
In $\triangle PQR$, if S is the midpoint of QR and T is the midpoint of PS , then $ar(\triangle QTS) = ?$



- $\frac{1}{3}ar(\triangle PQR)$
 $\frac{1}{4}ar(\triangle PQR)$
 $\frac{1}{4}ar(\triangle PQR)$
 $\frac{2}{3}ar(\triangle PQR)$
 $\frac{1}{2}ar(\triangle PQR)$

34

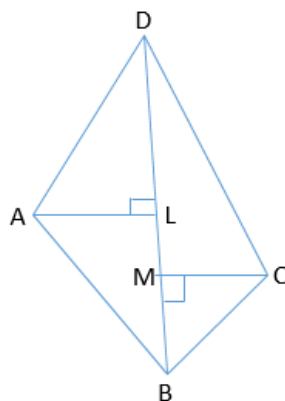
In the given figure $ABCD$ and $ABFE$ are parallelograms such that area of quadrilateral $EABC = 23 \text{ cm}^2$ and $ar(\text{llgm } ABCD) = 31 \text{ cm}^2$. Then, $ar(\triangle BCF) = ?$



- 8 cm^2
 8 cm^2
 10 cm^2
 12 cm^2
 7 cm^2

35

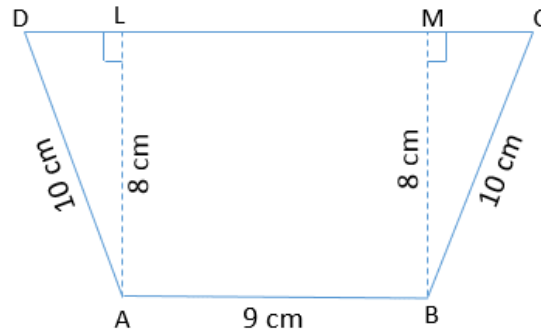
In a quadrilateral $ABCD$, it is given that $BD = 24 \text{ cm}$. If $AL \perp BD$ and $CM \perp BD$ such that $AL = 13 \text{ cm}$ and $CM = 8 \text{ cm}$, then $ar(\text{quad. } ABCD) = ?$



- 126 cm^2
 225 cm^2
 252 cm^2
 252 cm^2
 321 cm^2

36

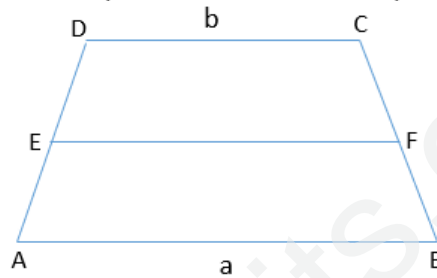
In the given figure ABCD is a trapezium such that $AL \perp DC$ and $BM \perp DC$. If $AB = 9$ cm, $BC = AD = 10$ cm and $AL = BM = 8$ cm, then $ar(\text{trapezium } ABCD) = ?$



- 240 cm^2
 120 cm^2
 120 cm^2
 30 cm^2
 60 cm^2

37

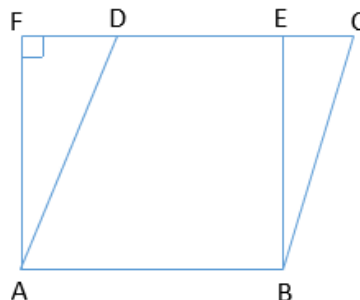
In the given figure ABCD is a trapezium in which $AB \parallel DC$ such that $AB = a$ cm and $DC = b$ cm. If E and F are the midpoints of AD and BC respectively. Then, $ar(EFCD) : ar(ABFE) = ?$



- $a : b$
 $(a + 2b) : (3a + 2b)$
 $(3a + b) : (a + 3b)$
 $(a + 3b) : (3a + b)$
 $(a + 3b) : (3a + b)$

38

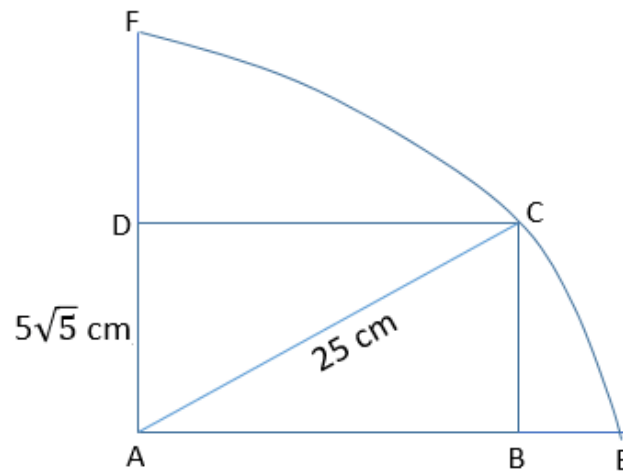
In the given figure, a parallelogram ABCD and a rectangle ABEF are of equal area. Then, perimeter of ABCD is _____ perimeter of ABEF.



- equal to
 less than
 greater than
 greater than
 twice of

39

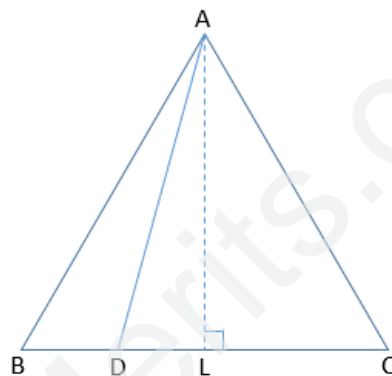
In the given figure, ABCD is a rectangle inscribed in a quadrant of a circle of radius 25 cm. If $AD = 5\sqrt{5}$ cm, then the area of the rectangle is



- 625 cm^2
 250 cm^2
 250 cm^2
 125 cm^2
 300 cm^2

40

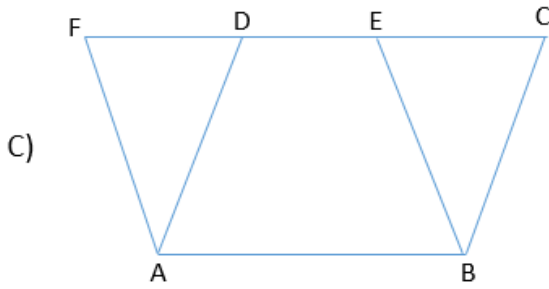
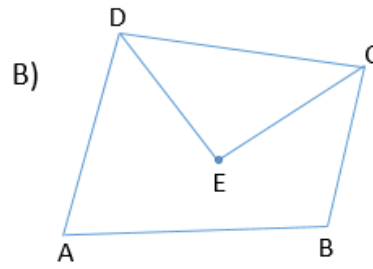
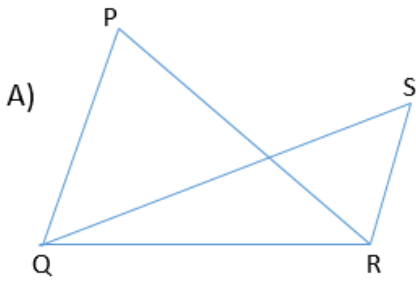
In the adjoining figure, the point D divides the side BC of $\triangle ABC$ in the ratio $m : n$. Then $ar(\triangle ABD) : ar(\triangle ADC) =$



- $n : m$
 $m : n$
 $m : n$
 $(m + n) : (m - n)$
 $3m : 2n$

41

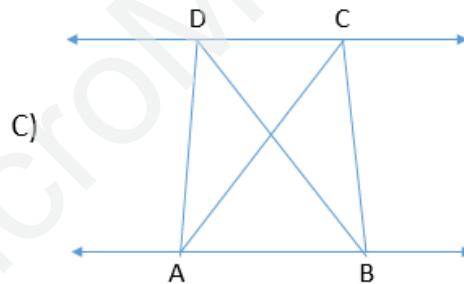
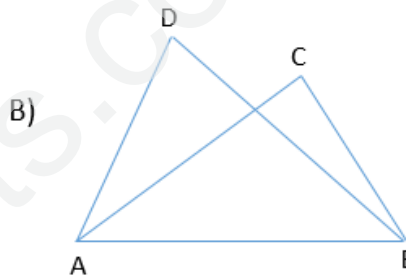
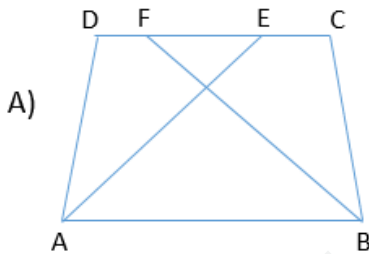
Which among the following figure has polygons on the same base and between the same parallels.



- A only B only C only All of these

42

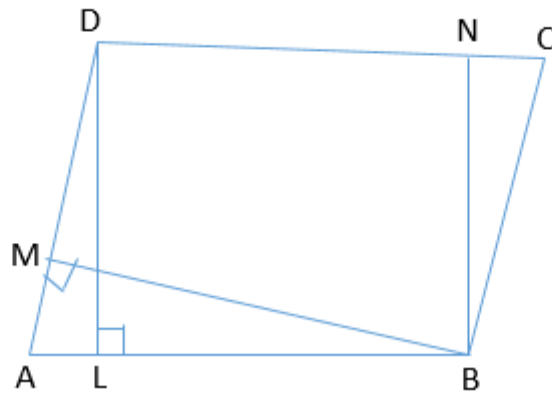
Which among the following figure are on the same base but not between the same parallels?



- A only B only C only None of the above

43

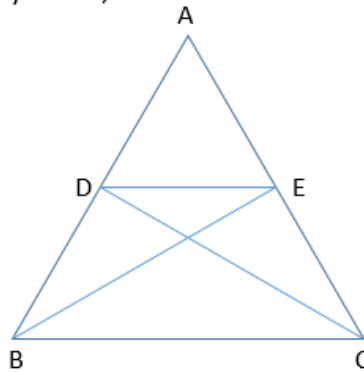
In the given figure, the area of the parallelogram ABCD is



- $AB \times BN$
 $BC \times BN$
 $DC \times DL$
 $DC \times DL$
 $AD \times DL$

44

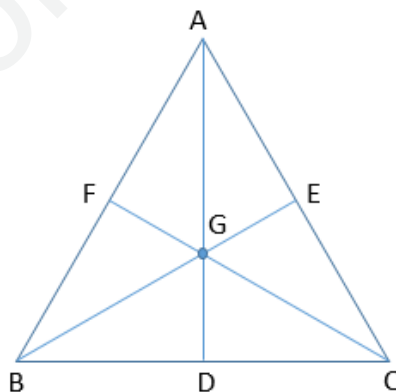
In the adjoining figure, D and E are points on the sides AB and AC of $\triangle ABC$ such that $\text{ar}(\triangle BCE) = \text{ar}(\triangle BCD)$. Then,



- $DE \perp BC$
 $DE \parallel BC$
 $DE \parallel BC$
 DE is neither parallel nor perpendicular BC
 None of the above

45

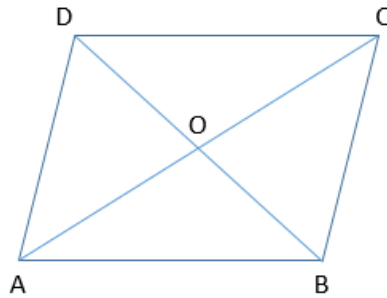
Let the medians of a $\triangle ABC$ intersect at G, such that $\text{ar}(\triangle AGC) = 6 \text{ cm}^2$. Then, $\text{ar}(\triangle ABC) = ?$



- 6 cm^2
 2 cm^2
 12 cm^2
 18 cm^2
 18 cm^2

46

In the given figure, ABCD is a parallelogram in which diagonals AC and BD intersect at O. If $\text{ar}(\text{llgm ABCD})$ is 64 cm^2 , then the $\text{ar}(\triangle OAB) = ?$



- 12 cm^2 14.5 cm^2 32 cm^2 16 cm^2 16 cm^2

47

The difference between the semi-perimeter and the sides of a $\triangle ABC$ are 15 cm , 10 cm and 5 cm respectively. The area of the triangle is

- 100 cm^2 150 cm^2 250 cm^2 195 cm^2

48

Each side of an equilateral triangle measures 6 cm . The area of the triangle is _____ (take $\sqrt{3} = 1.732$)

- 9 cm^2 14.67 cm^2 15.588 cm^2 15.735 cm^2

49

The base of an isosceles triangle is 12 cm long and each of its equal sides measures 8 cm . The area of the triangle is

- $3\sqrt{7} \text{ cm}^2$ $7\sqrt{7} \text{ cm}^2$ $6\sqrt{7} \text{ cm}^2$ $12\sqrt{7} \text{ cm}^2$

50

The base of an isosceles triangle is 8 cm and each of its equal sides is 6 cm . The height of the triangle is

- $2\sqrt{5} \text{ cm}$ $3\sqrt{5} \text{ cm}$ $5\sqrt{5} \text{ cm}$ $4\sqrt{5} \text{ cm}$

51

Each of the two equal sides of an isosceles right triangle is 13 cm long.

Its area is

- 169 cm^2 26 cm^2 52 cm^2 84.5 cm^2

52

The height of an equilateral triangle is 9 cm. Its area is

- $6\sqrt{3} \text{ cm}^2$ $27\sqrt{3} \text{ cm}^2$ 54 cm^2 108 cm^2

53

The sides of a triangle are in the ratio 5 : 12 : 13 and its perimeter is 150 cm . The area of the triangle is

- 150 cm^2 500 cm^2 750 cm^2 865 cm^2

54

The base of a right triangle is 36 cm and its hypotenuse is 39 cm long. the area of the triangle is

- 600 cm^2 585 cm^2 540 cm^2 270 cm^2

55

A triangle and a parallelogram have the same base and the same area . If the sides of the triangle are 15 cm , 14 cm and 13 cm , and the parallelogram stands on the base 15 cm , find the height of the parallelogram.

- 4.8 cm 5.6 cm 6 cm 11 cm

56

A traffic signal board , indicating 'SCHOOL AHEAD' , is an equilateral triangle with side 'a'. Find the perimeter of the signboard , if its area is $900\sqrt{3} \text{ cm}^2$.

- 120 cm 150 cm 180 cm 240 cm

57

A square and an equilateral triangle have equal perimeters. If the diagonal of the square is $12\sqrt{2} \text{ cm}$, then area of the triangle is :

- $32\sqrt{3} \text{ cm}^2$ $35\sqrt{5} \text{ cm}^2$ $64\sqrt{2} \text{ cm}^2$ $64\sqrt{3} \text{ cm}^2$

58

How much percentage of area will increase if each side of a triangle is doubled ?

- 300% 250% 400% 150%

59

Find the perimeter and area of the quadrilateral ABCD in which AB = 42 cm , BC = 21 cm , CD = 29 cm , DA = 34 cm and $\angle CBD = 90^\circ$.

- Perimeter = 546 cm² , Area = 126 cm² Perimeter = 126 cm² , Area = 546 cm²
 Perimeter = 156 cm² , Area = 526 cm² Perimeter = 216 cm² , Area = 336 cm²

60

By Heron's formula area of a triangle with sides a,b,c is given by

- area = $\sqrt{s(s-a)(s-b)(s-c)}$, $s = a + b + c$
 area = $\sqrt{s(s-a)(s-b)(s-c)}$, $s = 2(a + b + c)$
 area = $\sqrt{s(s+a)(s+b)(s+c)}$, $s = \frac{1}{2}(a + b + c)$
 area = $\sqrt{s(s-a)(s-b)(s-c)}$, $s = \frac{1}{2}(a + b + c)$

61

The area of an equilateral triangle of side 'a' units by Heron's formula is given by

- area = $\frac{\sqrt{3}a^2}{4}$ sq.units area = $\frac{\sqrt{2}a^2}{4}$ sq.units area = $\frac{3a^2}{4}$ sq.units
 area = $\frac{\sqrt{3}a^2}{2}$ sq.units

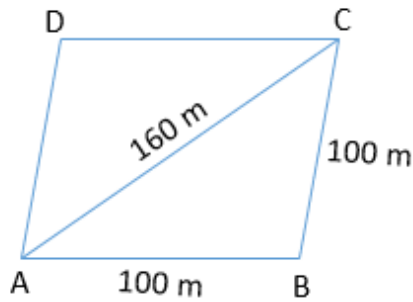
62

The cost of levelling a park at the rate of Rs.2 km² is Rs.2700. If the park is in right angled triangular form with one side being 45 km , then find the hypotenuse .

- 45 km 60 km 75 km 90 km

63

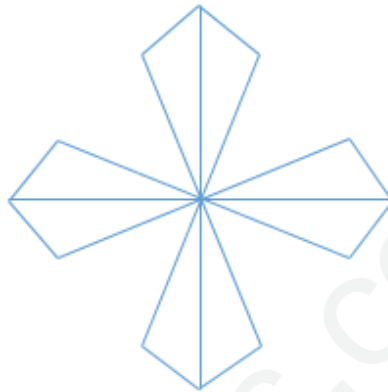
A piece of land is in the shape of a rhombus ABCD in which each side measures 100 m and diagonal AC is 160 m long. Then, the area of the rhombus is



- 4800 m^2
 5200 m^2
 7100 m^2
 9600 m^2
 9600 m^2

64

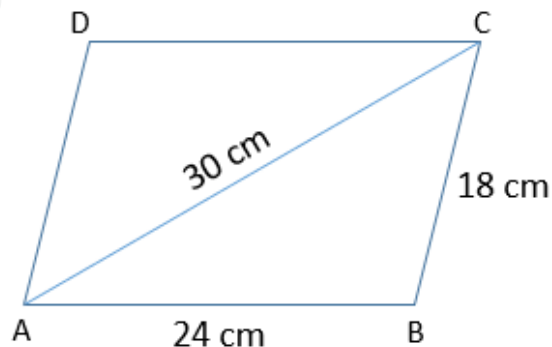
A floral design on a floor is made up of 8 triangular tiles, each having sides 8 cm, 15 cm and 17 cm. Find the cost of polishing the tiles at the rate of Rs. 1.50 per cm^2 .



- Rs. 480
 Rs. 600
 Rs. 720
 Rs. 720
 Rs. 750

65

Find the area of a parallelogram ABCD in which $AB = 24$ cm, $BC = 18$ cm and $AC = 30$ cm.



- 216 cm^2
 432 cm^2
 432 cm^2
 400 cm^2
 526 cm^2

MicroMerits.com is an innovative practice and assessment platform. The methodical practice sharpens your talent.

We provide Practice worksheets and Practice papers based on CBSE syllabus. These printable Worksheets and Practice Papers are available for FREE download

Helps students to score very good marks in their board exams. Also useful for students taking part in various competitions like NTSE, Olympiads, KVPY and for future JEE/NEET exams

Micromerits.com