



## MATHS

### NCERT - NCERT MATHEMATICS(HINGLISH)

### HERONS FORMULA

#### Exercise 12.2

1. A kite in the shape of a square with a diagonal  $32\text{cm}$  and an isosceles triangle of base  $8\text{cm}$  and sides  $6\text{cm}$  each is to be made of three different shades as shown in Figure . How much paper of each shade has been used in it ?

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2. A floral design on a floor is made up of 16 tiles which are triangular, the sides of the triangle being 9 cm, 28 cm and 35 cm (see Fig. 12.18). Find the cost of polishing the tiles at the rate of 50p per  $cm^2$ .

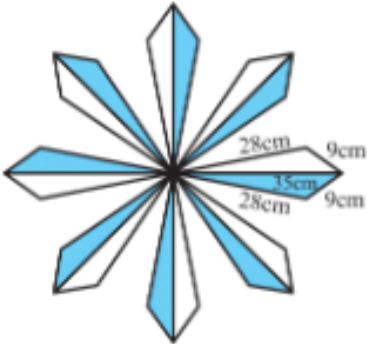


Fig. 12.18

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3. A field is in the shape of a trapezium whose parallel sides are  $25m$  and  $10m$ . If its non-parallel sides are  $14m$  and  $13m$ , find its area.

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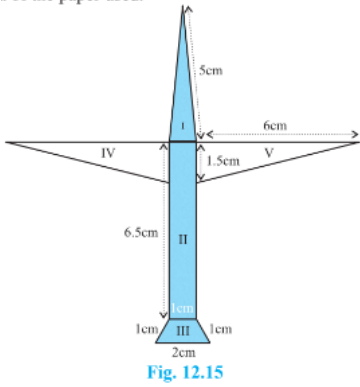
4. A rhombus shaped field has green grass for 18 cows to graze. If each side of the rhombus is 30 m and its longer diagonal is 48 m, how much area of grass field will each cow be getting?

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5. Find the area of a quadrilateral ABCD in which  $AB = 3\text{ cm}$ ,  $BC = 4\text{ cm}$ ,  $CD = 4\text{ cm}$ ,  $DA = 5\text{ cm}$  and  $AC = 5\text{ cm}$ .

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6. Radha made a picture of an aeroplane with coloured paper as shown in Fig 12.15. Find the total area of the paper used.



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7. A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are 26 cm, 28 cm and 30 cm, and the parallelogram stands on the base 28 cm, find the height of the parallelogram.

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8. A park, in the shape of a quadrilateral  $ABCD$ , has  $\angle C = 90^\circ$ ,  $AB = 9m$ ,  $BC = 12m$ ,  $CD = 5m$  and  $AD = 8m$ .

How much area does it occupy?



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9. An umbrella is made by stitching 10 triangular pieces of cloth of two different colour, each piece measuring  $20\text{cm}$ ,  $50\text{cm}$  and  $50\text{cm}$ .

How much cloth of each colour is required for the umbrella?

A.  $1000\sqrt{6}$

B.  $2000\sqrt{6}$

C.  $2500\sqrt{6}$

D.  $1500\sqrt{6}$

**Answer: A**



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## Exercise 12 1

1. A traffic signal board, indicating 'SCHOOL AHEAD', is an equilateral triangle with side  $a$ . Find the area of the signal board, using Heron's formula. If its perimeter is  $180\text{cm}$ , what will be the area of the signal board?

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2. There is a slide in a park. One of its side walls has been painted in some colour with a message "KEEP THE PARK GREEN AND CLEAN". If the sides of the wall are 15 m, 11 m and 6 m, find the area painted in colour.

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3. The triangular side walls of a flyover have been used for advertisements. The sides of the walls are 122 m, 22 m and 120 m. The advertisements yield an earning of *Rs 5000 per m<sup>2</sup> per year*. A company hired one of its wall for 3 months. How much rent did it pay?

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4. Sides of a triangle are in the ratio of 12 : 17 : 25 and its perimeter is 540 cm. Find its area.

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5. Find the area of a triangle two sides of which are 18 cm and 10 cm and the perimeter is 42 cm.

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6. An isosceles triangle has perimeter  $30\text{cm}$  and each of the equal sides is  $12\text{cm}$ . Find the area of the triangle.

A.  $8\sqrt{15}\text{cm}^2$

B.  $7\sqrt{15}\text{cm}^2$

C.  $9\sqrt{15}\text{cm}^2$

D.  $4\sqrt{15}\text{cm}^2$

**Answer: C**

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## Solved Examples

1. A triangular park  $ABC$  has sides  $120\text{m}$ ,  $80\text{m}$  and  $50\text{m}$ . A gardener Dhanika has to put a fence all around it and also plant



grass inside. How much area does she need to plant? Find the cost of fencing it with barbed wire at the rate of  $Rs20$  per metre leaving a space  $3m$  wide for a gate on one side.

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2. The sides of a triangular plot are in the ratio of  $3:5:7$  and its perimeter is  $300m$ . Find its area.

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3. Find the area of a triangle, two sides of which are  $8\text{ cm}$  and  $11\text{ cm}$  and the perimeter is  $32\text{ cm}$

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4. Sanya has a piece of land which is in the shape of a rhombus. She wants her one daughter and one son to work on the land and produce different crops. She divided the land in two equal parts. If the perimeter of the land is 400 m and one of the diagonals is 160 m, how much area each of them will get for their crops?

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5. Kamla has a triangular field with sides 240 m, 200 m, 360 m, where she grew wheat. In another triangular field with sides 240 m, 320 m, 400 m adjacent to the previous field, she wanted to grow potatoes and onions. She divided the field in two parts by joining the mid point of the longest side to the opposite vertex and grew potatoes in one part and onions in one part. How much area (in hectares) has been used for wheat, potatoes and onions? ( 1 hectare = 10000  $m^2$  )

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6. Students of a school staged a rally for cleanliness campaign. They walked through the lanes in two groups. One group walked through the lanes  $AB$ ,  $BC$  and  $CA$ ; while the other through  $AC$ ,  $CD$  and  $DA$  (see Fig. 12.12). Then they cleaned the area enclosed within their lanes. If  $AB = 9m$ ,  $BC = 40m$ ,  $CD = 15m$ ,  $DA = 28m$  and  $\angle B = 90^\circ$ , which group cleaned more area and by how much? Find the total area cleaned by the students (neglecting the width of the lanes).

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