Heron's Formula

1) The area of a triangle with base 4 cm and height 6 cm is 24 cm².

2) The area of $\triangle$ ABC is 8 cm² in which AB = AC = 4 cm and $\angle$A = 90°.

3) The area of the isosceles triangle is $\frac{5}{4}\sqrt{11}$ cm², if the perimeter is 11 cm and the base is 5 cm.

4) The area of the equilateral triangle is $20\sqrt{3}$ cm² whose each side is 8 cm.

5) If the side of a rhombus is 10 cm and one diagonal is 16 cm, the area of the rhombus is 96 cm².

6) The base and the corresponding altitude of a parallelogram are 10 cm and 3.5 cm, respectively. The area of the parallelogram is 30 cm².

7) The area of a regular hexagon of side 'a' is the sum of the areas of the five equilateral triangles with side a.

8) The cost of levelling the ground in the form of a triangle having the sides 51 m, 37 m and 20 m at the rate of Rs 3 per m² is Rs 918.

9) In a triangle, the sides are given as 11 cm, 12 cm and 13 cm. The length of the altitude is 10.25 cm corresponding to the side having length 12 cm.

10) Find the cost of laying grass in a triangular field of sides 50 m, 65 m and 65 m at the rate of Rs 7 per m².

11) The triangular side walls of a flyover have been used for advertisements. The sides of the walls are 13 m, 14 m and 15 m. The advertisements yield an earning of Rs 2000 per m² a year. A company hired one of its walls for 6 months. How much rent did it pay?

12) From a point in the interior of an equilateral triangle, perpendiculars are drawn on the three sides. The lengths of the perpendiculars are 14 cm, 10 cm and 6 cm. Find the area of the triangle.

13) The perimeter of an isosceles triangle is 32 cm. The ratio of the equal side to its base is 3 : 2. Find the area of the triangle.

14) Find the area of a parallelogram given in Fig. 12.2. Also find the length of the altitude from vertex A on the side DC.

15) A field in the form of a parallelogram has sides 60 m and 40 m and one of its diagonals is 80 m long. Find the area of the parallelogram.

16) The perimeter of a triangular field is 420 m and its sides are in the ratio 6 : 7 : 8. Find the area of the triangular field.

17) The sides of a quadrilateral ABCD are 6 cm, 8 cm, 12 cm and 14 cm (taken in order) respectively, and the angle between the first two sides is a right angle. Find its area.

Fig. 12.2

18) A rhombus shaped sheet with perimeter 40 cm and one diagonal 12 cm, is painted on both sides at the rate of Rs 5 per m². Find the cost of painting.

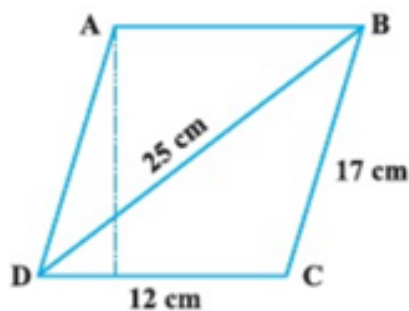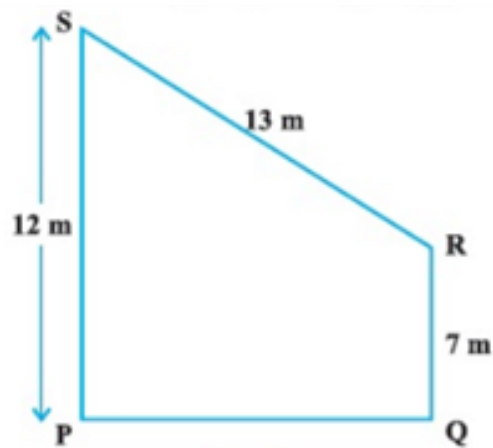Find the area of the trapezium PQRS with height PQ given in Fig. 12.3

Fig. 12.3

19) How much paper of each shade is needed to make a kite given in Fig. 12.4, in which ABCD is a square with diagonal 44 cm.
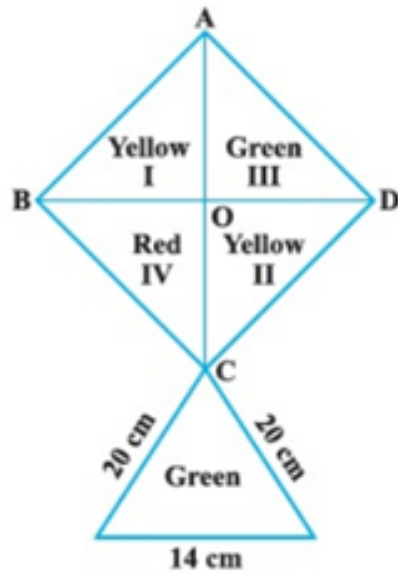

Fig. 12.4

20) The perimeter of a triangle is 50 cm. One side of a triangle is 4 cm longer than the smaller side and the third side is 6 cm less than twice the smaller side. Find the area of the triangle.

21) The area of a trapezium is 475 cm² and the height is 19 cm. Find the lengths of its two parallel sides if one side is 4 cm greater than the other.

22) A rectangular plot is given for constructing a house, having a measurement of 40 m long and 15 m in the front. According to the laws, a minimum of 3 m, wide space should be left in the front and back each and 2 m wide space on each of other sides. Find the largest area where house can be constructed.

23) A field is in the shape of a trapezium having parallel sides 90 m and 30 m. These sides meet the third side at right angles. The length of the fourth side is 100 m. If it costs Rs 4 to plough 1m² of the field, find the total cost of ploughing the field.

24) In Fig. 12.5, Δ ABC has sides AB = 7.5 cm, AC = 6.5 cm and BC = 7 cm. On base BC a parallelogram DBCE of same area as that of Δ ABC is constructed. Find the height DF of the parallelogram.

Fig. 12.5

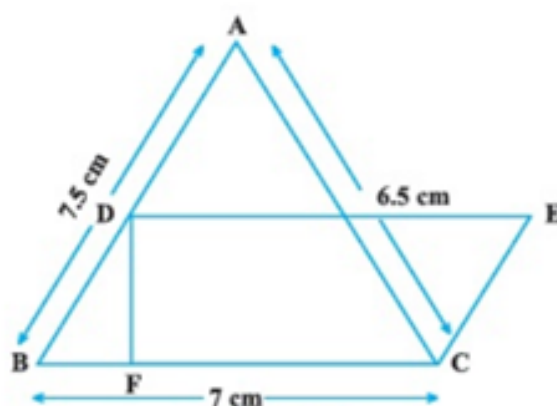**25)** The dimensions of a rectangle ABCD are 51 cm × 25 cm. A trapezium PQCD with its parallel sides QC and PD in the ratio 9 : 8, is cut off from the rectangle as shown in the Fig. 12.6. If the area of the trapezium PQCD is $\frac{5}{6}$ th part of the area of the rectangle, find the lengths QC and PD.
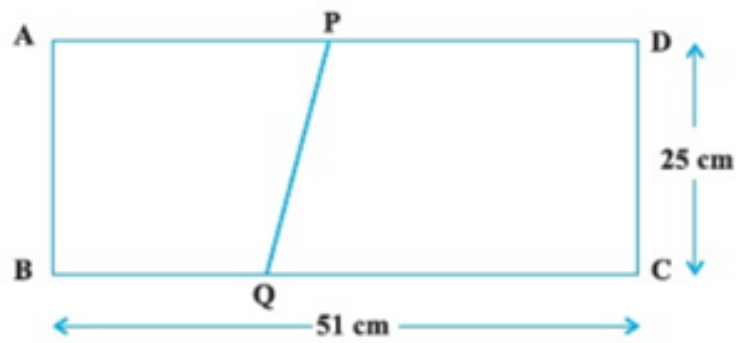
Fig. 12.6

26) A design is made on a rectangular tile of dimensions 50 cm × 70 cm as shown in Fig. 12.7. The design shows 8 triangles, each of sides 26 cm, 17 cm and 25 cm. Find the total area of the design and the remaining area of the tile.
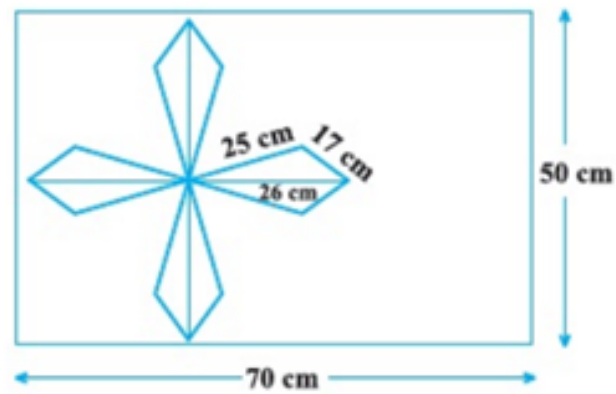

Fig. 12.7