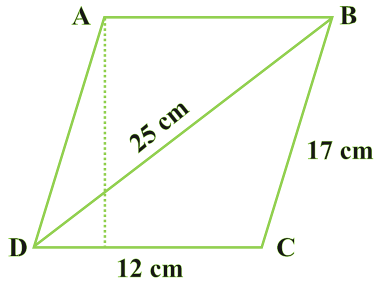
Exercise 12.3

Question 5:

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.



Answer 5:

Area of parallelogram ABCD =2 (Area of ΔABC)

Now, the sides of ΔBCD are a = 12cm, b = 17 cm an c = 25cm.

∴Semi- Perimeter of ΔBCD, $s = \frac{a+b+c}{2} = = \frac{12+17+25}{2} = \frac{54}{2}\ 27\ cm$

∴ Area of an isosceles ΔBCD

$= \sqrt{s(s-a)(s-b)(s-c)}$ [by Heron's formula]

$= \sqrt{27(27-12)(27-17)\ (27-25)}$

$= \sqrt{27 \times\ 15 \times\ 10 \times\ 2}$

$= \sqrt{9 \times 3 \times 3 \times 5 \times 5 \times 2 \times 2}$

= 3 × 3 × 5× 2 = 90cm^2

From Equation (i), we get

Area of parallelogram ABCD = 2 × 90 = 180cm^2

Let altitude of a parallelogram be h.

Also, area of a parallelogram ABCD = Base × Altitude

$\Rightarrow$ $180 = DC \times h$

$\Rightarrow$ $180 = 12 \times h$

$\therefore$ $h = \frac{180}{12} = 15\ cm$

Hence, the area o parallelogram is $180 cm^2$ and the length of altitude is 15 cm.