

Mathematics

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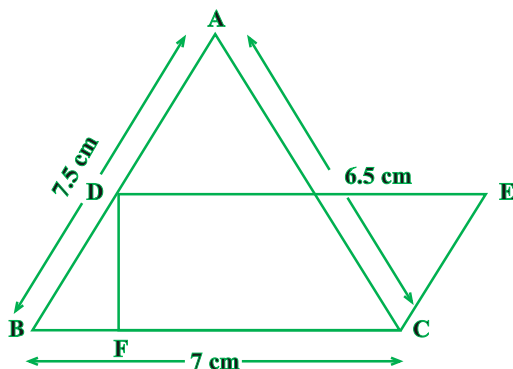
(Chapter – 12) (Heron's Formula)(Exemplar Problems)

(Class – IX)

Exercise 12.4

Question 6:

In Fig. 12.5, ΔABC 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 ΔABC is constructed. Find the height DF of the parallelogram.



Answer 6:

Now, first determine the area of ΔABC .

The sides of a triangle are

$AB = a = 7.5$ cm, $BC = b = 7$ cm and $CA = c = 6.5$ cm

Now, Semi- Perimeter, $s = \frac{a+b+c}{2} = \frac{7.5+7+6.5}{2} = \frac{21}{2} = 10.5$ cm

\therefore Area of a $\Delta ABC = \sqrt{s(s-a)(s-b)(s-c)}$ [by Heron's formula]

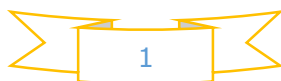
$$= \sqrt{10.5(10.5 - 7.5)(10.5 - 7)(10.5 - 6.5)}$$

$$= \sqrt{10.5 \times 3 \times 3.5 \times 4}$$

$$= \sqrt{441} = 21\text{cm}^2 \quad \dots\dots\dots(i)$$

Now, area of parallelogram $BCED = \text{Base} \times \text{Height}$

$$= BC \times DF = 7 \times DF \quad \dots\dots\dots(ii)$$



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According to the question,

Area of ΔABC = Area of parallelogram BCED

$$\Rightarrow 21 = 7 \times DF \quad [\text{From Equations (i) and (ii)}]$$

$$\Rightarrow DF = \frac{21}{7} = 3\text{cm}$$

Hence, the height of parallelogram is 3 cm

