

Mathematics

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

(Class – IX)

Exercise 12.2

Write **True** or **False** and justify your answer:

Question 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.

Answer 9:

True

Since, the sides of a triangle are $a = 11\text{cm}$, $b = 12\text{cm}$ and $c = 13\text{cm}$.

Now, semi – perimeter

$$s = \frac{a + b + c}{2} = \frac{11 + 12 + 13}{2} = \frac{36}{2} = 18 \text{ cm}$$

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

$$= \sqrt{18(18-11)(18-12)(18-13)}$$

$$= \sqrt{18 \times 7 \times 6 \times 5}$$

$$= \sqrt{3 \times 6 \times 7 \times 6 \times 5}$$

$$= 6\sqrt{3 \times 7 \times 5}$$

$$= 6\sqrt{105} = 6 \times 10.25$$

$$= 615 \text{ cm}^2$$

\therefore Area of a $\Delta ABC = \frac{1}{2} \times BC \times AD$

[\therefore Area of a triangle = $\frac{1}{2}$ (base \times height)]

$$= \frac{1}{2} \times 12 \times 10.25 = 6 \times 10.25 = 61.5 \text{ cm}^2$$

