

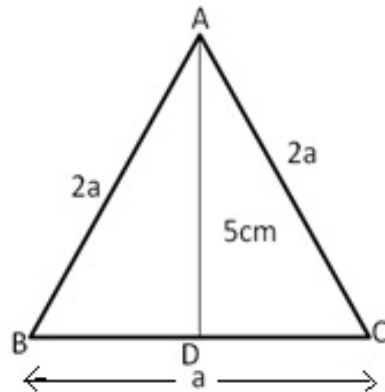


Exercise 4D

Question 11:

Given: $\triangle ABC$ in which $AB = AC = 2a$ units and $BC = a$ units

Const: Draw $AD \perp BC$ then D is the midpoint of BC.



In $\triangle ABC$

$$BC = a$$

$$\text{and } BD = \frac{BC}{2} = \frac{a}{2}$$

In $\triangle ADB$,

$$(AB)^2 = AD^2 + BD^2$$

$$AD^2 = (AB^2 - BD^2)$$

$$AD^2 = \left[(2a)^2 - \left(\frac{a}{2} \right)^2 \right]$$

$$AD^2 = \left[4a^2 - \frac{a^2}{4} \right] = \frac{15a^2}{4}$$

$$\Rightarrow AD = \frac{a\sqrt{15}}{2} \text{ units}$$

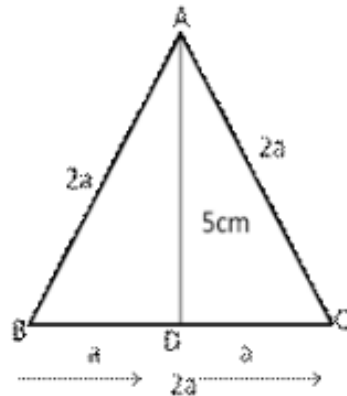
Question 12:

In an equilateral triangle all sides are equal.

Then, $AB = BC = AC = 2a$ units

Const: Draw an altitude $AD \perp BC$

Given $BC = 2a$. Then, $BD = a$



In $\triangle ABD$,

$$\angle ADB = 90^\circ$$

$$(AB)^2 = (AD)^2 + (BD)^2$$

(by pythagoras theorem)

$$(AD)^2 = (AB^2 - BD^2)$$

$$= [(2a)^2 - (a)^2] \text{ sq. units}$$

$$= (4a^2 - a^2) \text{ sq. unit} = 3a^2 \text{ sq. unit}$$

$$AD = \sqrt{3a^2} \text{ unit} = a\sqrt{3} \text{ unit}$$

***** END *****