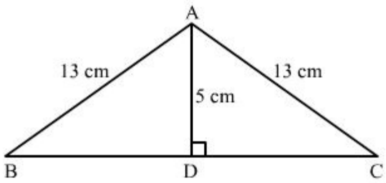
Triangles Ex 4.7 Q12

Answer :



We have given an isosceles triangle and we know that the altitude drawn on the unequal side of the isosceles triangle bisects that side.

Therefore, in ΔADB and ΔADC

$\angle B = \angle C$ (Equal sides have equal angles opposite to them)

$AD = AD$

$\angle ADB = \angle ADC$ 90° each

$\Delta ADB \cong \Delta ADC$ (AAS congruence theorem)

$\therefore BD = DC$

Now we will use Pythagoras theorem in right angled triangle ADB.

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

Let us substitute the values of AB and AD we get, $13^2 = 5^2 + BD^2$

$169 = 25 + BD^2$

Subtracting 25 from both sides we get,

$BD^2 = 169 - 25$

$BD^2 = 144$

$\therefore BD = 12$

Since $BC = 2BD$

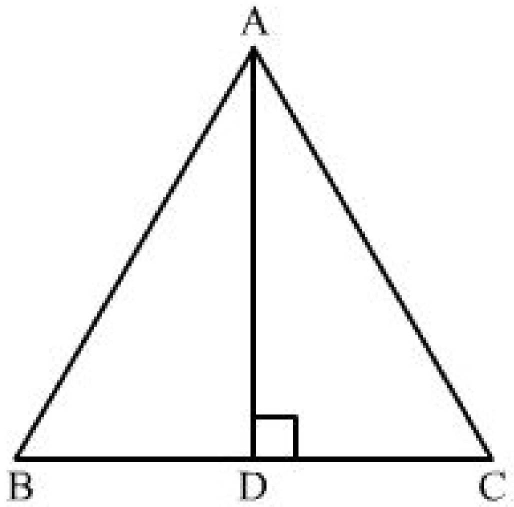
$\therefore \quad BC = 2 \times 12$

$= 24$

Therefore, length of BC is $\boxed{24 \text{ cm}}$.

Triangles Ex 4.7 Q13

Answer :



In ΔADB and ΔADC

$\angle B = \angle C$ (60° each)

$AD = AD$

$\angle ADB = \angle ADC$ (90° each)

$\Delta ADB \cong \Delta ADC$ (AAS congruence theorem)

$\therefore BD = DC$

$\therefore BC = 2BD$

But $BC = 2a$ therefore, we get,

$2a = 2BD$ ....(1)

Now we will divide both sides of the equation (1) by 2, we get,

$\therefore BD = a$

Now we will use Pythagoras theorem in right angled triangle ADB.

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

Now we will substitute the values of AB and BD we get,

$$(2a)^2 = AD^2 + a^2$$
$$4a^2 = AD^2 + a^2$$
$$3a^2 = AD^2$$
$$\therefore AD = \sqrt{3}a$$

Therefore, $AD = \boxed{\sqrt{3}a}$.

We have given an equilateral triangle and we know that the area of the equilateral triangle is $\frac{\sqrt{3}}{4} \times side^2$.

Here, side is $2a$

$$\therefore A(\Delta ABC) = \frac{\sqrt{3}}{4} \times (2a)^2$$
$$\therefore A(\Delta ABC) = \frac{\sqrt{3}}{4} \times 4a^2$$
$$A(\Delta ABC) = \sqrt{3}a^2$$

Therefore, $A(\Delta ABC) = \boxed{\sqrt{3}a^2}$.

*********** END **********