Triangles Ex 4.3 Q1

Answer :

(i) It is given that $BD = 2.5\text{cm}$, $AB = 5\text{cm}$ and $AC = 4.2\text{cm}$.

In ΔABC, AD is the bisector of $\angle A$, meeting side BC at D.

We have to find DC.

Since AD is $\angle A$ bisector

Then $\frac{AB}{AC} = \frac{2.5}{DC}$

$$\frac{5}{4.2} = \frac{2.5}{DC}$$

$$5DC = 4.2 \times 2.5$$

$$DC = \frac{4.2 \times 2.5}{5}$$

$$= 2.1$$

Hence $\boxed{DC = 2.1\text{cm}}$

(ii) It is given that $BD = 2\text{cm}$, $AB = 5\text{cm}$ and $DC = 3\text{cm}$.

In ΔABC, AD is the bisector of $\angle A$, meeting side BC at D.

We have to find AC.

Since AD is $\angle A$ bisector

So $\frac{AB}{AC} = \frac{BD}{DC}$ (AD is bisector of $\angle A$ and side BC)

Then

$$\frac{5}{AC}=\frac{2}{3}$$

$$\Rightarrow 2AC=5\times 3$$

$$\Rightarrow AC=\frac{15}{2}$$

$$=7.5$$

Hence $\boxed{AC=7.5\text{cm}}$

(iii) It is given that $AB=3.5\text{cm}$, $AC=4.2\text{cm}$ and $DC=2.8\text{cm}$.

In ΔABC, AD is the bisector of $\angle A$, meeting side BC at D.

We have to find *BD*.

Since AD is $\angle A$ bisector

So $\frac{AB}{AC}=\frac{BD}{DC}$ (AD is bisector of $\angle A$ and side BC)

Then

$$\frac{3.5}{4.2}=\frac{BD}{2.8}$$

$$\Rightarrow BD=\frac{3.5\times 2.8}{4.2}$$

$$\Rightarrow BD=\frac{7}{3}$$

$$=2.3$$

Hence $\boxed{BD=2.3\text{cm}}$

(iv) It is given that $AB=10\text{cm}$, $AC=14\text{cm}$ and $BC=6\text{cm}$.

In ΔABC, AD is the bisector of $\angle A$, meeting side BC at D.

We have to find *BD* and DC.

Since AD is $\angle A$ bisector

So $\frac{AB}{AC}=\frac{BD}{DC}$ (AD is bisector of $\angle A$ and side BC)

Then

$$\frac{10}{14}=\frac{x}{6-x}$$

$$\Rightarrow 14x=60-6x$$

$$\Rightarrow 20x=60$$

$$\Rightarrow x=\frac{60}{20}$$

Hence $\boxed{BD=3\text{cm}}$ and $\boxed{DC=3\text{cm}}$

(v) It is given that $AC=4.2\text{cm}$, $DC=6\text{cm}$ and $BC=10\text{cm}$.

In ΔABC, AD is the bisector of $\angle A$, meeting side BC at D.

We have to find AB.

Since AD is $\angle A$ bisector

So $\frac{AC}{AB}=\frac{DC}{BD}$

Then

$$\frac{4.2}{AB}=\frac{6}{4}$$

$$\Rightarrow 6AB = 4.2 \times 4$$

$$\Rightarrow AB = \frac{4.2 \times 4}{6}$$

$$= \frac{16.8}{6}$$

Hence $\boxed{AB = 2.8\text{cm}}$

(vi) It is given that $AB = 5.6\text{cm}$, $BC = 6\text{cm}$ and $DC = 3\text{cm}$.

In ΔABC, AD is the bisector of $\angle A$, meeting side BC at D.

We have to find BC.

Since AD is $\angle A$ bisector

So $\frac{AC}{AB} = \frac{BD}{DC}$

Then

$$\frac{6}{5.6} = \frac{3}{DC}$$

$$\Rightarrow DC = 2.8$$

So

$$BC = 2.8 + 3$$

$$= 5.8$$

Hence $\boxed{BC = 5.8\text{cm}}$

(vii) If it is given that *AB* = 5.6 cm, $BC = 6\text{cm}$ and $BD = 3.2\text{cm}$.

In ΔABC, AD is the bisector of $\angle A$, meeting side BC at D

$$\therefore \frac{AB}{AC} = \frac{BD}{DC}$$

$$\frac{5.6\text{ cm}}{AC} = \frac{3.2\text{ cm}}{2.8\text{ cm}} \qquad [DC = BC - BD]$$

$$AC = \frac{5.6 \times 2.8}{3.2}\text{ cm} = 4.9\text{ cm}$$

(viii) It is given that $AB = 10\text{cm}$, $AC = 6\text{cm}$ and $BC = 12\text{cm}$.

In ΔABC, AD is the bisector of $\angle A$, meeting side BC at D.

We have to find *BD* and DC.

Since AD is $\angle A$ bisector

So $\frac{AC}{AB} = \frac{DC}{BD}$

Let *BD* = *x* cm

Then

$$\frac{6}{10} = \frac{12 - x}{x}$$

$$\Rightarrow 6x = 120 - 10x$$

$$\Rightarrow 16x = 120$$

$$\Rightarrow x = \frac{120}{16}$$

$$\Rightarrow x = 7.5$$

Now

$$DC = 12 - BD$$

$$= 12 - 7.5$$

$$= 4.5$$

Hence $\boxed{BD = 7.5\text{cm}}$ and $\boxed{DC = 4.5\text{cm}}$

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