



### Properties of Triangles Ex 15.3 Q15

Answer :

The interior angles of a triangle are the three angle elements inside the triangle.

The exterior angles are formed by extending the sides of a triangle, and if the side of a triangle is produced, the exterior angle so formed is equal to the sum of the two interior opposite angles.

Using these definitions, we will obtain the values of  $x$  and  $y$ .

(i)

From the given figure, we can see that :

$$\angle ACB + x = 180^\circ \text{ (Linear pair)}$$

$$\Rightarrow 75^\circ + x = 180^\circ$$

Or,

$$x = 105^\circ$$

We know that the sum of all angles of a triangle is  $180^\circ$ .

Therefore, for  $\triangle ABC$ , we can say that :

$$\angle BAC + \angle ABC + \angle ACB = 180^\circ$$

$$\Rightarrow 40^\circ + y + 75^\circ = 180^\circ$$

Or,

$$y = 65^\circ$$

(ii)

$$x + 80^\circ = 180^\circ \text{ (Linear pair)}$$

$$= x = 100^\circ$$

In  $\triangle ABC$  :

$$x + y + 30^\circ = 180^\circ \text{ (Angle sum property)}$$

$$100^\circ + 30^\circ + y = 180^\circ$$

$$= y = 50^\circ$$

(iii)

We know that the sum of all angles of a triangle is  $180^\circ$ .

Therefore, for  $\triangle ACD$ , we can say that :

$$30^\circ + 100^\circ + y = 180^\circ$$

Or,

$$y = 50^\circ$$

$$\angle ACB + 100^\circ = 180^\circ$$

$$\angle ACB = 80^\circ \dots (i)$$

Using the above rule for  $\triangle ACB$ , we can say that :

$$x + 45^\circ + 80^\circ = 180^\circ.$$

$$= x = 55^\circ$$

(iv)

We know that the sum of all angles of a triangle is  $180^\circ$ .

Therefore, for  $\triangle DBC$ , we can say that :

$$30^\circ + 50^\circ + \angle DBC = 180^\circ$$

$$\angle DBC = 100^\circ$$

$$x + \angle DBC = 180^\circ \text{ (Linear pair)}$$

$$x = 80^\circ$$

And,

$$y = 30^\circ + 80^\circ = 110^\circ \text{ (Exterior angle property)}$$

\*\*\*\*\*END\*\*\*\*\*