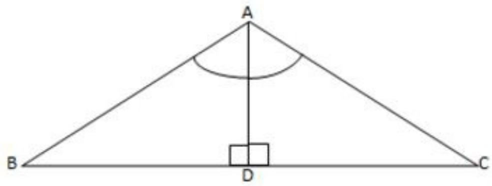
Properties of Triangles Ex 15.2 Q20

Answer :



Consider $\triangle$ ABD.

$\angle BAD = \frac{100^\circ}{2}$ $\left(\because AD \text{ bisects } \angle A\right)$

$\Rightarrow \angle BAD = 50^\circ$

$\angle ADB = 90^\circ$ $\left(\because AD \perp BC\right)$

We know that the sum of all three angles of a triangle is 180°.

Thus,

$\angle ABD + \angle BAD + \angle ADB = 180^\circ$ $\left(\text{Sum of angles of } \triangle ABD\right)$

Or,

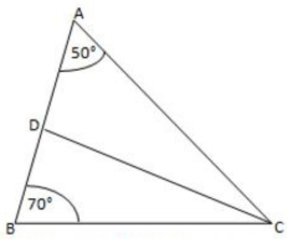
$\angle ABD + 50^\circ + 90^\circ = 180^\circ$

$\angle ABD = 180^\circ - 140^\circ$

$\angle ABD = 40^\circ$

Properties of Triangles Ex 15.2 Q21

Answer :



We know that the sum of all three angles of a triangle is equal to 180°.

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

$\angle A + \angle B + \angle C = 180^\circ$ $\left(\text{Sum of angles of } \triangle ABC\right)$

$\Rightarrow 50^\circ + 70^\circ + \angle C = 180^\circ$

$\angle C = 180^\circ - 120^\circ$

$\angle C = 60^\circ$

$\angle ACD = \angle BCD = \frac{\angle C}{2}$ $\left(\text{CD bisects } \angle C \text{ and meets AB in D.}\right)$

$\Rightarrow \angle ACD = \angle BCD = \frac{60^\circ}{2} = 30^\circ$

Using the same logic for the given $\triangle$ ACD, we can say that :

$\angle DAC + \angle ACD + \angle ADC = 180^\circ$

$\Rightarrow 50^\circ + 30^\circ + \angle ADC = 180^\circ$

$\angle ADC = 180^\circ - 80^\circ$

$\angle ADC = 100^\circ$

If we use the same logic for the given $\triangle$ BCD, we can say that :

$\angle DBC + \angle BCD + \angle BDC = 180^\circ$

$\Rightarrow 70^\circ + 30^\circ + \angle BDC = 180^\circ$

$\angle BDC = 180^\circ - 100^\circ$

$\angle BDC = 80^\circ$

Thus,

For $\triangle$ ADC : $\angle A = 50^\circ$, $\angle D = 100^\circ$, $\angle C = 30^\circ$

For $\triangle$ BDC : $\angle B = 70^\circ$, $\angle D = 80^\circ$, $\angle C = 30^\circ$

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