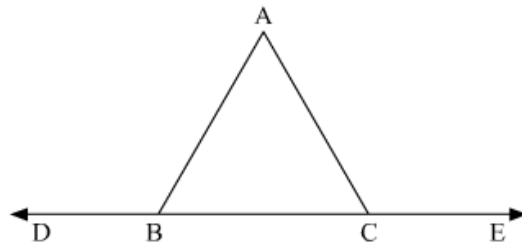Congruent Triangles Ex 10.1 Q10

Answer:

It is given that the base of an isosceles triangle is produced on both sides.

We have to prove that the exterior angles so formed are equal to each other.

That is we need to show that $\angle ABD = \triangle ACE$

Let the $\triangle ABC$ is isosceles having base BC and equal sides AB and AC

Then, $AB = AC$ and $\angle ABC = \angle ACB$

$\Rightarrow \angle B = \angle C$ (Isosceles triangles)

Now

$\angle ABD + \angle ABC = 180^0$ ....(1)

And,

$\angle ACB + \angle ACE = 180^0$ ....(2)

Thus

$$\angle ABD = 180^0 - \angle ABC$$

$$\Rightarrow \angle ABD = 180^0 - \angle B \quad \text{........(3)}$$

Now from equation (2)

$$\angle ACE = 180^0 - \angle ACB$$

$$\angle ACE = 180^0 - \angle C \quad \text{.........(4)}$$

Since $\angle B = \angle C$

Hence from equation (3) and (4)

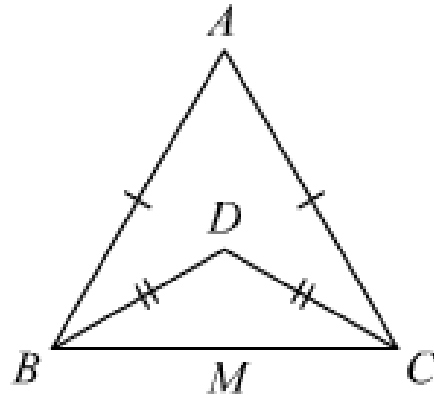$$\boxed{\angle ABD = \angle ACE}$$

Congruent Triangles Ex 10.1 Q11

Answer :

It is given that

$AB = AC$

$DB = DC$

We have to find the ratio $\angle ABD : \angle ACD$.

Since $AB = AC$

$\Rightarrow \angle ABC = \angle ACB$

And $DB = DC$

$\Rightarrow \angle DBC = \angle DCB$

So we have,

$\angle ABC - \angle DBC = \angle ACB - \angle DCB$

$\Rightarrow \angle ABD = \angle ACD$

So

$$\frac{\angle ABD}{\angle ACD} = 1$$

Hence $\boxed{\angle ABD : \angle ACD = 1}$.