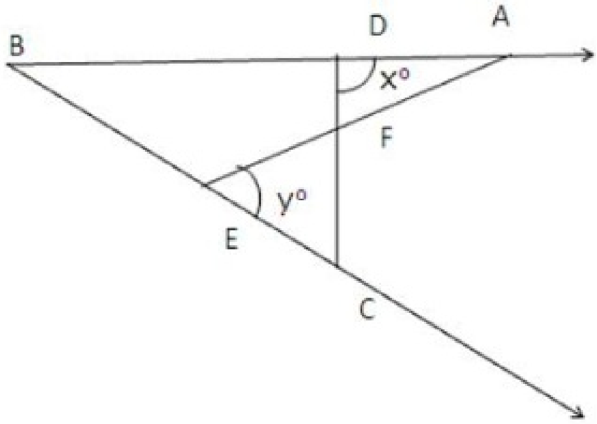
Exercise 5A

Question 17:

Given: AB = BC

and, $x^\circ = y^\circ$



To prove: AE = CD

Proof: In ΔABE, we have,

Exterior $\angle AEB = \angle EBA + \angle BAE$

$\Rightarrow$ $y^\circ = \angle EBA + \angle BAE$

Again, in ΔBCD we have

$x^\circ = \angle CBA + \angle BCD$

Since, $x = y$ [Given]

So, $\angle EBA + \angle BAE = \angle CBA + \angle BCD$

$\Rightarrow$ $\angle BAE = \angle BCD$

Thus in ΔBCD and ΔBAE, we have

$\angle B = \angle B$ [Common]

BC = AB [Given]

and, $\angle BCD = \angle BAE$ [Proved above]

Thus by Angle-Side-Angle criterion of congruence, we have

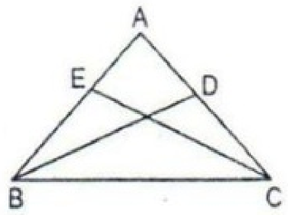
$\Delta BCD \cong \Delta BAE$

The corresponding parts of the congruent triangles are equal.

So, CD = AE [Proved]

Question 18:

Given: A ΔABC in which $AB = AC$ and
BD and CE are the bisectors of $\angle B$ and $\angle C$ respectively.



To prove: $BD = CE$

Proof: In ΔABD and ΔACE

$$\angle ABD = \frac{1}{2} \angle B$$

and $$\angle ACE = \frac{1}{2} \angle C$$

But $\angle B = \angle C$ as $AB = AC$ [In Isosceles triangle, base angles are equal]

$\Rightarrow$ $\angle ABD = \angle ACE$

$AB = AC$ [Given]

$\angle A = \angle A$ [Common]

Thus by Angle-Side-Angle criterion of congruence, we have

$\Delta ABD \cong \Delta ACE$ [By ASA]

The corresponding parts of the congruent triangles are equal.

$\therefore$ $BD = CE$ [C.P.C.T]

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