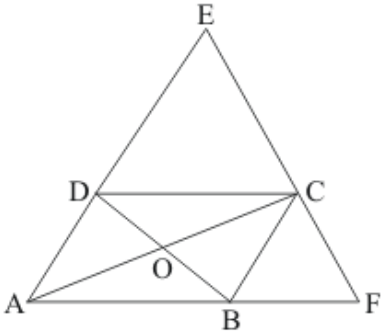
Quadrilaterals Ex 14.3 Q9

Answer :

ABCD is a parallelogram, *AD* produced to *E* such that $DE = DC$.



Also , *AB* produced to *F*.

We need to prove that $BF = BC$

In ΔACE, *D* and *O* are the mid-points of *AE* and *AC* respectively.

By using Mid-point Theorem, we get:

$DO \parallel EC$

Since, *BD* is a straight line and *O* lies on *AC*.

And, *C* lies on *EF*

$OB \parallel CF$

Therefore,

$AB = BF$ ..... (i)

Also, $ABCD$ is a parallelogram with $AB = DC$.

Thus,

$DC = BF$

In ΔEDC and ΔCBF ,we have:

$DC = BF$

$\angle EDC = \angle CBF$

$\angle ECD = \angle CFB$

So, by ASA Congruence criterion, we have:

$\Delta EDC \cong \Delta CBF$

By corresponding parts of congruence triangles property, we get:

$DE = BC$

$DC = BC$

$AB = BC$

From (i) equation, we get:

$\boxed{BF = BC}$

Hence proved.

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