

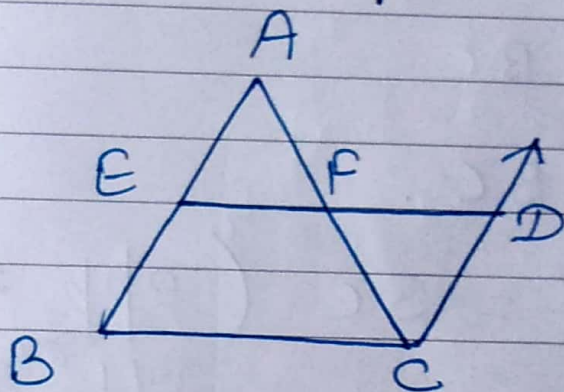
05/09/xx

Class-IX (MATHS) K. Kanhaiya

Topic \Rightarrow The Mid-point theorem:-

Theorem:- The line segment joining the mid-points of two sides of a triangle is parallel and half of the third side.

Ans \rightarrow



Given:- E and F are mid-points of AB and AC respectively.

Const:- Produce $EF = FD$ and draw $CD \parallel AB$

To prove:- $EF \parallel BC$, $EF = \frac{1}{2} BC$

Proof:- In $\triangle AEF$ and $\triangle CDF$
 $EF = FD$ (from Const)
 $\angle AFE = \angle CFD$ (V.O.A)
 $\angle EAF = \angle FCD$ (altⁿ int \angle s)

$\therefore \triangle AEF \cong \triangle CDF$ by AAS

So By CPCT
 $AE = CD$ also

Now, $CD = AE \Rightarrow CD = BE$ $\{\because AE = BE$

$\therefore CD = BE$ and $CD \parallel BE$

So $BCDE$ is a \parallel^{gm} .

i.e. $DE \parallel BC$

& $EF \parallel BC$.

Also, $DE = BC$ (Opp sides of a \parallel^{gm} are equal)

$$2 EF = BC$$

$$EF = \frac{1}{2} BC$$

Do yourself :-

The line drawn through the mid-point of one side of a triangle, parallel to another side bisect the third side.