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CLASS:X

SUB.: MATHS (NCERT BASED)

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Theorem 6.2

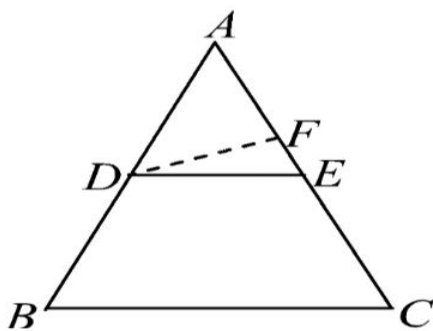
(Converse of BPT theorem) If a line divides any two sides of a triangle in the same ratio, prove that it is parallel to the third side.

Given: In $\triangle ABC$, DE is a straight line such that $\frac{AD}{DB} = \frac{AE}{EC}$.

To prove: $DE \parallel BC$.

Construction: If DE is not parallel to BC, draw DF meeting AC at F.

Proof: In $\triangle ABC$, let $DF \parallel BC$



$$\therefore \frac{AD}{DB} = \frac{AF}{FC} \dots(i)$$

From (i) and (ii), we get

$$\frac{AF}{FC} = \frac{AE}{EC}.$$

Adding 1 to both sides, we get

$$\frac{AF}{FC} + 1 = \frac{AE}{EC} + 1$$

$$\Rightarrow \frac{AF + FC}{FC} = \frac{AE + EC}{EC}$$

$$\Rightarrow \frac{AC}{FC} = \frac{AC}{EC} \Rightarrow FC = EC.$$

It is possible only when E and F coincide

Hence, $DE \parallel BC$.