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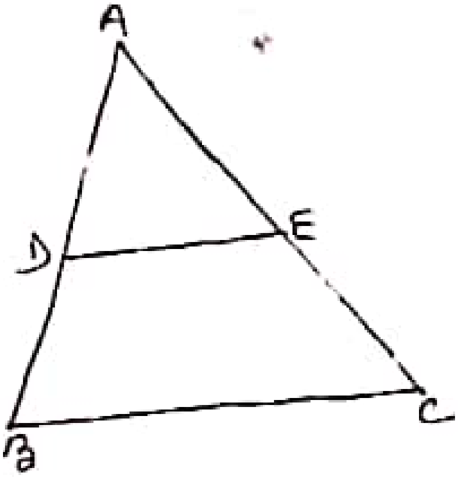
Class-X

Sub- Mathematics Date:- 03|09|2020

Some important Rule

In triangle ABC when DE || BC than

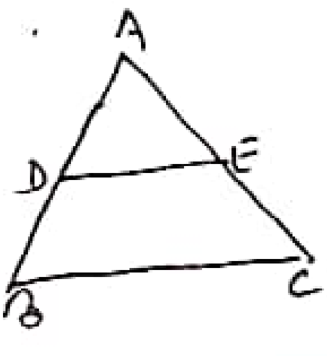


(I) $\frac{AD}{DB} = \frac{AE}{AC}$ (II) $\frac{DB}{AD} = \frac{EC}{AE}$

(III) $\frac{AD}{AB} = \frac{AE}{AC}$ (IV) $\frac{DB}{AB} = \frac{EC}{AC}$

(V) $\frac{AB}{AD} = \frac{AC}{AE}$ (VI) $\frac{AB}{DB} = \frac{AC}{EC}$

<u>Example</u>:- If a line intersects sides AB and AC of $\triangle ABC$, at D and E respectively and is parallel to BC. Prove that $\frac{AD}{AB} = \frac{AE}{AC}$



<u>Soln</u> In $\triangle ABC$, DE || BC

$\frac{AD}{DB} = \frac{AE}{EC}$ (by B.P.T)

$\Rightarrow \frac{DB}{AD} = \frac{EC}{AE}$

$\Rightarrow$

$$1 + \frac{DB}{AD} = 1 + \frac{EC}{AE} \quad \text{(Adding 1 both sides)}$$

$$\Rightarrow \frac{AD + DB}{AD} = \frac{AE + EC}{AE}$$

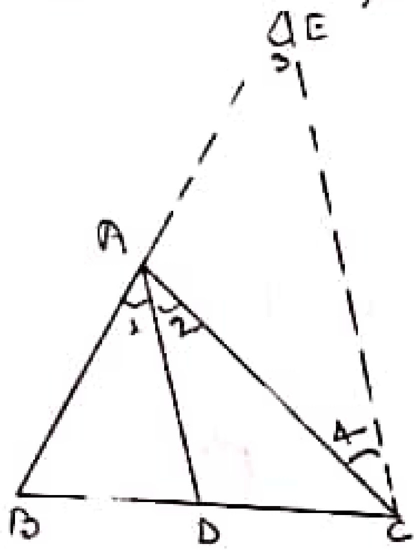
$$\Rightarrow \frac{AB}{AD} = \frac{AC}{AE}$$

$$\therefore \frac{AD}{AB} = \frac{AE}{AC} \quad \text{Proved}$$

Thale's corollary

Angle bisector theorem

An angle bisector of a $\triangle$ divides the interior angle's opposite side into two segments that are proportional to the other two sides of the triangle.



Const:- Through the point C draw $CE \parallel AD$. BA produced to E.

Proof:- $AD \parallel CE$, BE is transversal.

$\angle 1 = \angle 3$ (Corresponding $\angle$s) —(I)

$AD \parallel CE$, AC is transversal

$\angle 2 = \angle 4$ (alternate $\angle$s) —(II)

AD is angle bisector of $\angle A$

$\angle 1 = \angle 2$

$\therefore \angle 3 = \angle 4$ (from eqn (I) and (II))

$AC = AE$ (opposite sides of equal angles)

In $\triangle EBC$,

$AD \parallel CE$

$\frac{BA}{AE} = \frac{BD}{DC}$ (by B.P.T)

$\therefore \frac{AB}{AC} = \frac{BD}{DC}$

Given:- In $\triangle ABC$, AD is the angle bisector of $\angle A$ which intersect opposite BC at point D.

To Prove:- $\frac{AB}{AC} = \frac{BD}{DC}$

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