Areas of Parallelograms and Triangles Ex 15.3 Q28

Answer :

Given:

In ΔABC, if L and M are points on AB and AC such that $LM \| BC$

To prove:

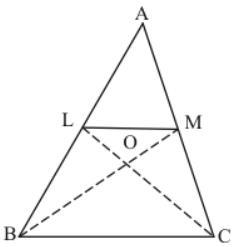
(i) $ar(\Delta LCM) = ar(\Delta LBM)$

(ii) $ar(\Delta LBC) = ar(\Delta MBC)$

(iii) $ar(\Delta ABM) = ar(\Delta ACL)$

(iv) $ar(\Delta LOB) = ar(\Delta MOC)$

Proof: We know that triangles between the same base and between the same parallels are equal in area.



(i) Here we can see that ΔLMB and ΔLMC are on the same base BC and between the same parallels LM and BC

Therefore

$$\boxed{ar(\Delta LBC) = ar(\Delta LBM)} \quad \ldots\ldots (2)$$

(iii) From equation (1) we have,

$$ar(\Delta LMC) = ar(\Delta LBM)$$

$$ar(\Delta ALM) + ar(\Delta LMC) = ar(\Delta ALM) + ar(\Delta LBM)$$

$$\Rightarrow \boxed{ar(\Delta ABM) = ar(\Delta ACL)}$$

(iv) From (2) we have,

$$ar(\Delta LBC) = ar(\Delta MBC)$$

$$ar(\Delta LBC) - ar(\Delta BOC) = ar(\Delta MBC) - ar(\Delta BOC)$$

$$\Rightarrow \boxed{ar(\Delta LOB) = ar(\Delta MOC)}$$

Areas of Parallelograms and Triangles Ex 15.3 Q29

Answer :

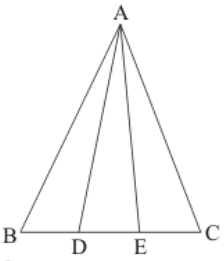
Given: In ΔABCD, D and E are two points on BC such that BD = DE = EC

To prove:

$\text{ar}(\Delta ABD) = \text{ar}(\Delta ADE) = \text{ar}(\Delta AEC)$

Proof: The ΔABD, ΔADE, and ΔAEC, are on the equal bases and their heights are equal

Therefore their areas are equal



So

$\text{ar}(\Delta ABD) = \text{ar}(\Delta ADE) = \text{ar}(\Delta AEC)$

Hence we get the result as $\boxed{\text{ar}(\Delta ABD) = \text{ar}(\Delta ADE) = \text{ar}(\Delta AEC)}$

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