



Congruent Triangles Ex 10.1 Q1

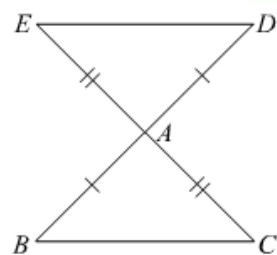
Answer :

It is given that

$$BA = AD$$

$$CA = AE$$

We have to prove that $DE \parallel BC$



Now considering the two triangles we have

In $\triangle EAD$ & $\triangle BAC$

$$EA = BA \text{ (Given)}$$

$$AD = AC \text{ (Given)}$$

We need to show $\angle CED = \angle ECB$ or $\angle BDE = \angle DBC$ to prove $DE \parallel BC$.

Now

$$\angle EAD = \angle BAC \text{ (Vertically opposite angle)}$$

So by SAS congruence criterion we have

$$\triangle EAD \cong \triangle CAB$$

So $\angle AED = \angle ACB$ and

$$\angle ADE = \angle ABC$$

Then

$$\angle CED = \angle ECB, \text{ and}$$

$$\angle BDE = \angle ABC$$

Hence from above conditions $\boxed{DE \parallel BC}$.

Congruent Triangles Ex 10.1 Q2

Answer :

It is given that

$$PQ = QR$$

And L is the mid point of PQ

$$\text{So } PL = LQ$$

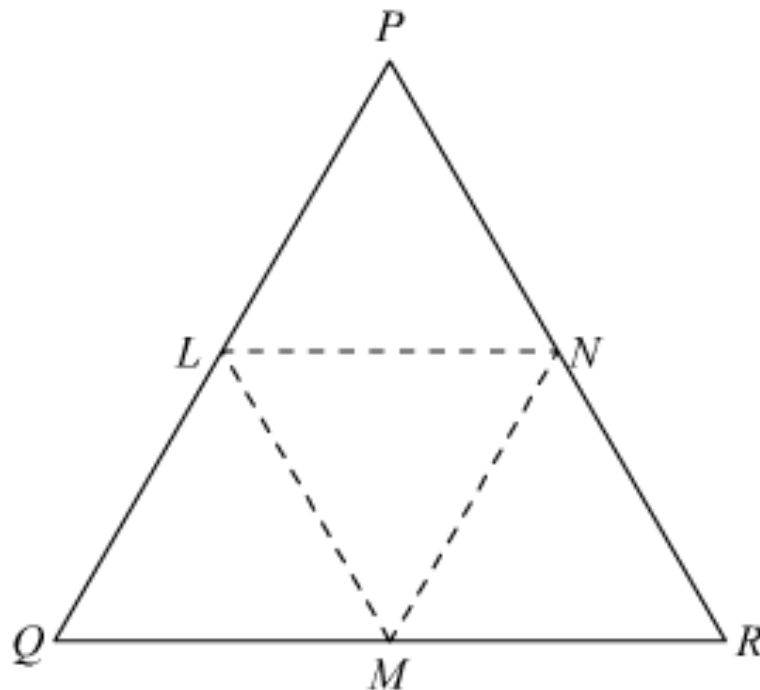
And M is the mid point of QR

$$\text{So } QM = MR$$

And N is the mid point of RP

$$\text{So } RN = NP$$

We have to prove that $LM = MN$



In $\triangle PQR$, we have

$$PQ = QR \text{ and } \angle R = \angle P \text{ (Equilateral triangle)}$$

Then

$$\frac{1}{2}PQ = \frac{1}{2}QR, \text{ and } \angle P = \angle R$$

$$PL = MR, \text{ and } \angle P = \angle R$$

Similarly comparing $\triangle MRN$ and $\triangle LPN$ we have

$$PL = MR, \text{ and } \angle P = \angle R$$

And $PN = NR$ (Since N is the mid point of PR)

So by SAS congruence criterion, we have

$$\triangle MRN \cong \triangle LPN$$

Hence $\boxed{MN = LN}$.

*****END*****