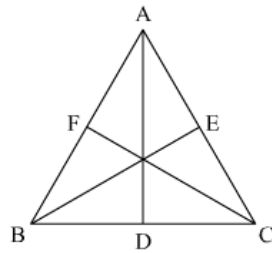## Congruent Triangles Ex 10.6 Q7

Answer :

We have to prove that the perimeter of a triangle is greater than the sum of its altitude.

In $\triangle ABC$

$AD \perp BC$, $BE \perp AC$, $CF \perp AB$

We have to prove $AB + BC + CD > AD + BE + CF$

Since $AD \perp BC$

So $AB > AD$ and $AC > AD$

By adding $AB + AC > AD + AD$, we have

$AB + AC > 2AD$ ....(1)

Now consider $BE \perp AC$ then

$BC > BE$, and $BA > BE$

Now by adding $BC + BA > 2BE$ ....(2)

Again consider $CF \perp AB$

$AC > CF$, and $BC > CF$

By adding $AC + BC > 2CF$ ....(3)

Adding (1), (2) and (3), we get
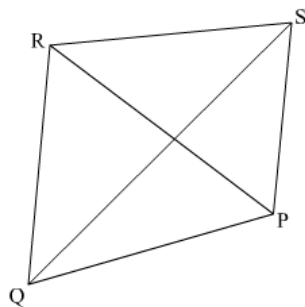
$2(AB + BC + CA) > 2(AD + BE + CF)$

$\Rightarrow AB + BC + CA > AD + BE + CF$

Hence the perimeter of a triangle is greater than the sum of all its altitude.

Congruent Triangles Ex 10.6 Q8

Answer :

We have to prove that the sum of four sides of quadrilateral is greater than sum of diagonal.

Since the sum of two sides of triangle is greater than third side.

In $\triangle PQR$ we have

$PQ + QR > PR$ ....(1)

In $\triangle RSP$ we have

$RS + SP > PR$ ....(2)

In $\triangle PQS$ we have

$PQ + SP > QS$ ....(3)

In $\triangle QRS$ we have

$QR + RS > QS$ ....(4)

Adding (1) & (2) & (3) and (4) we get

$$2(PQ + QR + RS + SQ) > 2(PR + QS)$$

Hence $\boxed{PQ + QR + RS + SQ > PR + QS}$ Proved.

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