Congruent Triangles Ex 10.2 Q1
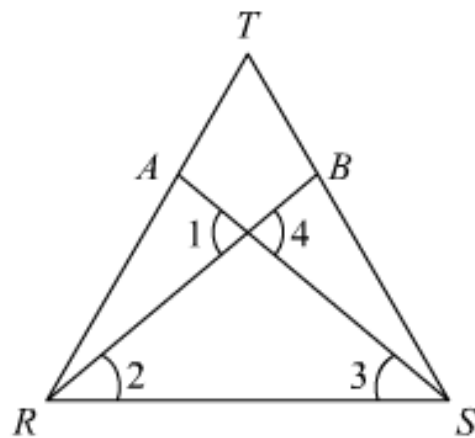
Answer :

It is given that

$RT = TS$

$\angle 1 = 2\angle 2$

$\angle 4 = 2\angle 3$

We have to prove that $\triangle RBT \cong \triangle SAT$

Now

In $\triangle RTS$ we have

$RT = ST$

$\Rightarrow \angle TSR = \angle TRS$ (Isosceles triangle)   ....(1)

Now we have

$\angle 1 = \angle 4$ (Vertically opposite angles)

$\Rightarrow 2\angle 2 = 2\angle 3$ (Since $\angle 1 = 2\angle 2$ and $\angle 4 = 2\angle 3$, given)

$\angle 2 = \angle 3$ ....(2)

Subtracting equation (2) from equation (1) we have

$\angle TRS - \angle 3 = \angle TSR - \angle 2$

$\Rightarrow \angle TRB = \angle TSA$

Now in $\triangle RBT$ and $\triangle SAT$ we have

$\angle RTB = \angle STA$

and $RT = ST$ (Given)

So all the criterion for the two triangles $\triangle RBT$ and $\triangle RBT$ are satisfied to be congruent

Hence by ASA congruence criterion we have $\boxed{\triangle RBT \cong \triangle SAT}$ proved.

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