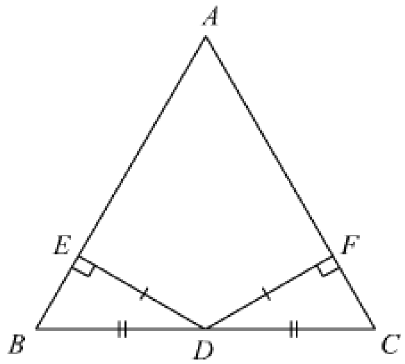
Congruent Triangles Ex 10.5 Q1

**Answer :**

We have to prove that $\Delta ABC$ is isosceles.




Let $DE$ and $DF$ be perpendicular from D on $AB$ and $AC$ respectively.

In order to prove that $AB = AC$

We will prove that $\Delta BDE \cong \Delta CDF$

Now in $\Delta BDE$ and $\Delta CDF$ we have

$\angle BED = \angle CFD = 90^0$

$BD = CD$ (Since $D$ is mid point of $BC$)

$DE = DF$ (Given)

So by $RHS$ congruence criterion we have

$\Delta BDE \cong \Delta CDF$

$\Rightarrow \angle B = \angle C$

And $AC = AB$

Hence $\Delta ABC$ is isosceles.

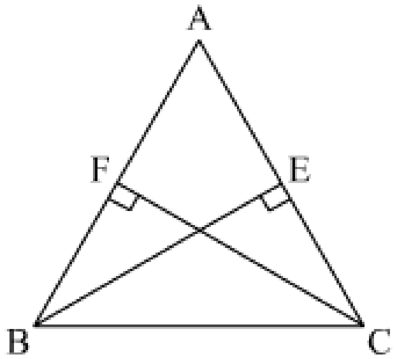
Congruent Triangles Ex 10.5 Q2

**Answer :**

It is given that

$BE \perp AC$, and $CF \perp AB$

And $BE = CF$.




We have to prove $\Delta ABC$ is isosceles.

To prove $\Delta ABC$ is isosceles we will prove $\angle B = \angle C$

For this we have to prove $\Delta BFC \cong \Delta CEB$

Now comparing $\Delta BFC$ and $\Delta CEB$ we have

$BE = CF$ (Given)

$BC = BC$ (Common side)

So, by right hand side congruence criterion we have

$\Delta BFC \cong \Delta CEB$

$\Rightarrow \angle FBC = \angle ECB$

$\Rightarrow \angle ABC = \angle ACB$

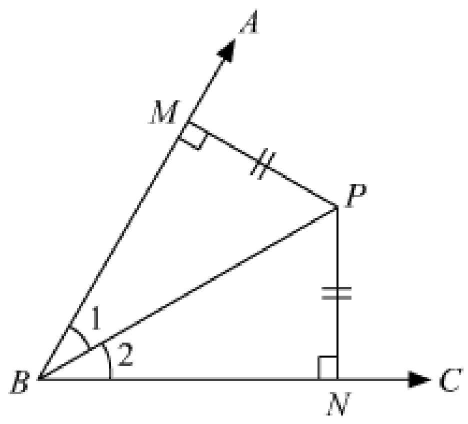
So $AB = AC$ (since sides opposite to equal angle are equal)

Hence $\Delta ABC$ is isosceles.

Congruent Triangles Ex 10.5 Q3

**Answer :**

Let $P$ be a point within $\angle ABC$ such that $PM = PN$




We have to prove that $P$ lies on the bisector of $\angle ABC$

In $\Delta PMB$ and $\Delta PNB$ we have

$PM = PN$ (We have)

$BP = BP$ (Common)

$\angle BMP = \angle BNP = 90^0$

So by right hand side congruence criterion, we have

$\Delta PBM \cong \Delta PBN$

So, $\angle 1 = \angle 2$

Hence $P$ lies on the bisector of $\angle ABC$ proved.

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