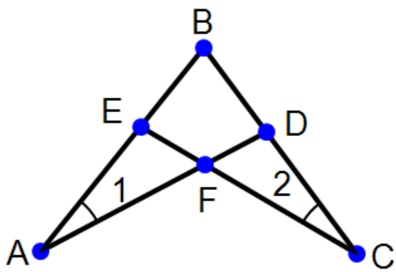
MathCity.org Merging man and maths	**Exercise 10.1 (Solutions)** Mathematics 9th (Science) Punjab Textbook Board

Q.1 In the given figure, $\overline{AB} \cong \overline{CB}$, $\angle 1 \cong \angle 2$,
Prove that $\Delta ABD \cong \Delta CBE$.

Solution: ***Given:*** $\overline{AB} \cong \overline{CB}$ and $\angle 1 \cong \angle 2$

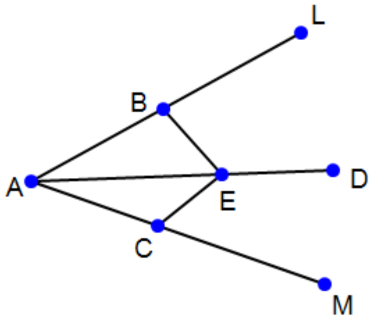
To prove: $\Delta ABD \cong \Delta CBE$.



Proof:

Statement	Reasons
In $\Delta ABD \leftrightarrow \Delta\ CBE$	
$\overline{AB} \cong \overline{CB}$	Given
$\angle BAD \cong \angle BCE$	Given $\angle 1 \cong \angle 2$
$\angle ABD \cong \angle CBE$	Common
$\Delta ABD \cong \Delta CBE$	S.A.A postulate

Q.2 From the point on the bisector of an angle of an angle, perpendiculars are drawn to the arm of the angle. Prove that these perpendiculars are equal in measure



Solution: ***Given:*** AD bisects of an angle $\angle BAC$ from point E, draw $\overline{EC} \perp \overline{AM}$ and $\overline{EB} \perp \overline{AL}$.

To prove: $\overline{EB} \cong \overline{EC}$

Proof:

Statement	Reasons
In $\Delta AEB \leftrightarrow \Delta\ AEC$	
$\overline{AE} \cong \overline{AE}$	Common
$m\angle ABE = m\angle ACE$	Each right angle is given
$m\angle BAE = m\angle CAE$	Given $\overline{AD}$ is bisector of angle A
$\therefore$ $\Delta ABE = \Delta ACE$	S.A.A postulate
So $\overline{EB} \cong \overline{EC}$	Corresponding sides of congruent triangles.

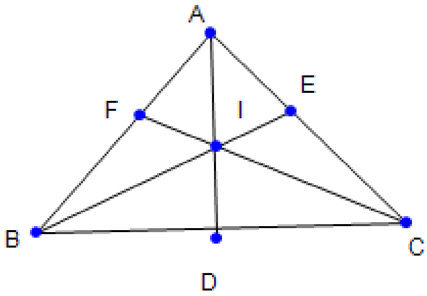
Q.3 In triangle ABC, the bisectors of $\angle B$ and $\angle C$ meet in a point I. Prove that I is equidistant from the three sides of ΔABC.

Solution: ***Given:***

In ΔABC, $\overline{IF} \perp \overline{AB}$, $\overline{IE} \perp \overline{AC}$, $\overline{ID} \perp \overline{BC}$.

To prove:

$\overline{ID} \cong \overline{IE} \cong \overline{IF}$.



Proof:

Statement	Reasons
In $\Delta IDB \leftrightarrow \Delta\ IFB$	
$\overline{BI} \cong \overline{BI}$	Common
$\angle IBD \cong \angle IBF$	Given BI is bisector of $\angle B$
$\angle IDB \cong \angle IFB$	Given each angle is right angle
$\Delta IDB \cong \Delta IFB$	$S.A.S$ Postulates
$\therefore\ \overline{ID} \cong \overline{IF}$ .....(i)	Corresponding sides of $\cong \Delta's$
Similarly,	
$\Delta IFA \cong \Delta IEA$	
So $\therefore\ \overline{IF} \cong \overline{IE}$ .....(ii)	Corresponding sides of $\cong \Delta's$
From (i) *and* (ii)	
$\overline{ID} \cong \overline{IE} \cong \overline{IF}$	
$\therefore I$ is equidistant from the three sides of ΔABC	

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