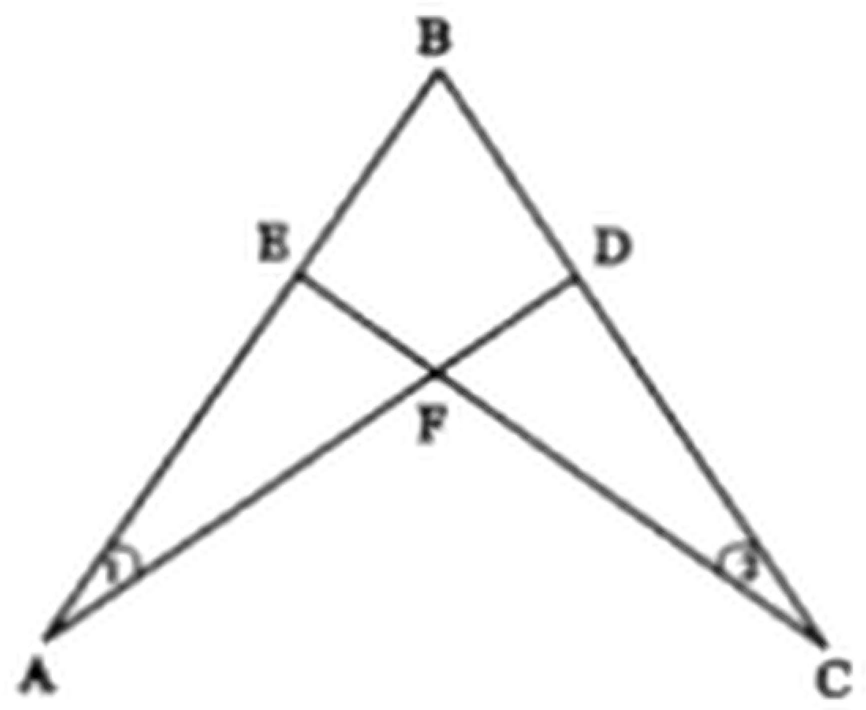
Exercise 10.1

Q1. In the given figure, AB ≅ CB, ∠1 ≅ ∠2. Prove that Δ ABD ≅ ΔCBE.

Solution:



Given:

In the given figure ∠1 ≅ ∠2 and $\overline{AB} \cong \overline{CB}$

To prove:

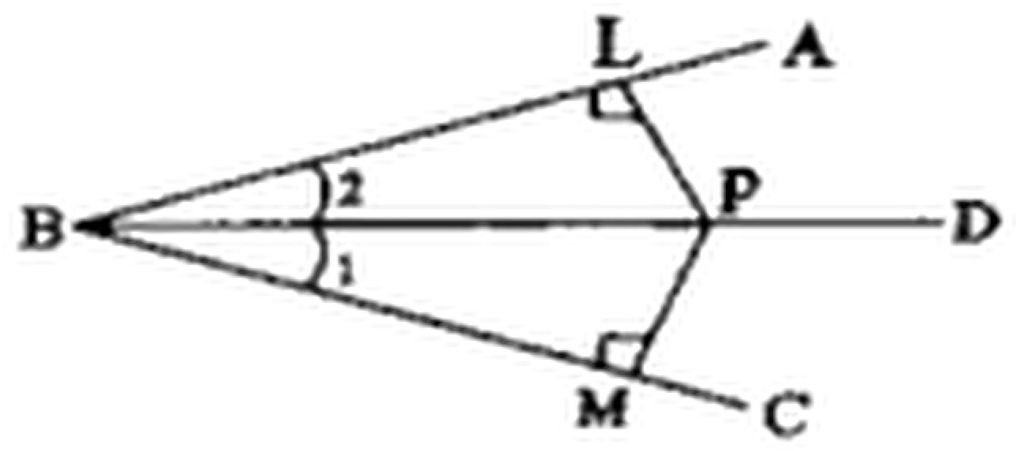
ΔABD ≅ ΔCBE

Proof:

Statements	Reasons
In ΔABD ↔ ΔCBE	
AB ≅ CB	Given
∠BAD ≅∠BCE	Given ∠1 ≅ ∠2
∠ABD ≅∠CBE	Common
∴ ΔABD ≅ΔCBE	S.A.A ≅ S.A.A

Q2. From a point on the bisector of an angle, perpendiculars are drawn to the arms of the angle. Prove that these perpendiculars are equal in measure.

Solution:



Given:

$\overline{BD}$ is bisector of ∠ABC. P is point on $\overline{BD}$ and $\overline{PL}$ and $\overline{PM}$ are perpendicular to $\overline{AB}$ and $\overline{CB}$ respectively

To prove:

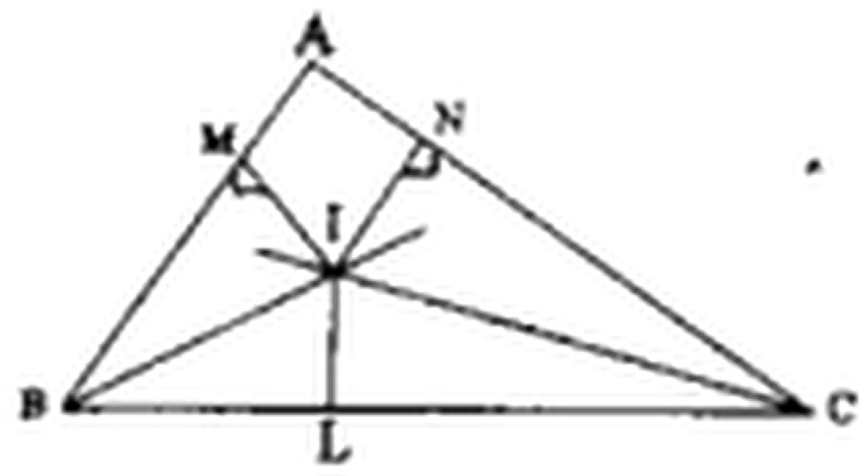
$\overline{PL} \cong \overline{PM}$

Proof:

Statements	Reasons
In ΔBLP ↔ ΔBMP	
$\overline{BP} \cong \overline{BP}$	Common
∠BLP ≡ ∠BMP	Each right angle (given)
∠LBP ≡ ∠MBP	Given BD is bisector of angle B
ΔBLP ≅ ΔBMP	S.A.A ≅ S. A. A.
So $\overline{PL} \cong \overline{PM}$	Corresponding sides of ≅ Δ's.

Q3. In a triangle ABC, the bisectors of ∠B and ∆C meet in a point. Prove that I is equidistant from the three sides of ∆ABC.

Solution:



Given:

In ∆ABD the bisector of ∠B and ∠C meet at I, IL, IM and IN are perpendiculars to the three sides of ∆ABD.

To prove:

$\overline{IL} \cong \overline{IM} \cong \overline{IN}$

Proof:

Statements	Reasons
In ∆ILB ↔ ∆IMB	
$\overline{BI}$ $\overline{BI}$	Common
∠IBL ≅ ∠IBM	Given BI is bisector of ∠B
∠ILB ≅ ∠IMB	Given each ∠ is right angles.
∆ILB ≅ ∆IMB	S.A.A ≅ S.A.A.
$\overline{IL}$ $\overline{IM}$ (i)	Corresponding sides of ≅ ∆s.
Similarly	
∆IAC ≅ ∆INC	
So IL ≅ IN (ii)	

From (i)and (ii) $\overline{IL} \cong \overline{IM} \cong \overline{IN}$ I is equidistant from the three sides of ΔABC.	Corresponding sides of ≅ Δs.