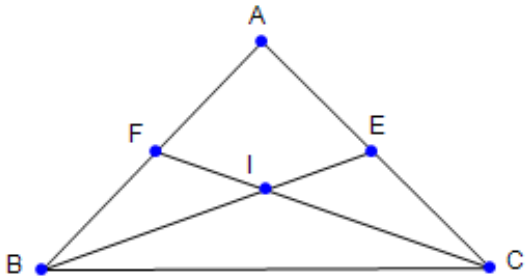
Q.1 Prove that any two medians of an equilateral triangle are equal in measure.

Solution: Given: In ΔABC is an equilateral triangle.

$\overline{AB} = \overline{AC} = \overline{BC}$

$\overline{BE}$ *and* $\overline{CF}$ are its medians.

To prove: $\overline{BE} \cong \overline{CF}$



Proof:

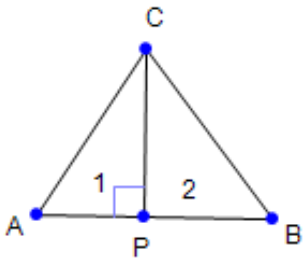
Statement	Reasons
In $\Delta BCE \leftrightarrow \Delta CBF$	
$\overline{BC} \cong \overline{BC}$	Common
$\angle FBC \cong \angle ECB$	Angles of equilateral triangles
$\overline{BF} \cong \overline{CE}$	Half of equal sides
$\Delta BCE \cong \Delta CBF$	$S.A.S \cong S.A.S$
Hence $\overline{BE} \cong \overline{CF}$	

Q.2 Prove that a point, which is equidistant from the end points of a line segment, is on the right bisector of the line segment.

Solution: Given:

$\overline{AB}$ is a line segment. The point C is such that $\overline{CA} \cong \overline{CB}$

To prove: Point C lies on the right bisector of $\overline{AB}$.



Construction:

(i) Take P as the midpoint of $\overline{AB}$. *i.e* $\overline{AP} \cong \overline{BP}$.

(ii) Join point C to A, B *and* P .

Proof:

Statement	Reasons
In ΔABC	
$\overline{CA} \cong \overline{CB}$	Given
$\angle A \cong \angle B$	Corresponding angles of congruent triangles.
$\overline{CP} \cong \overline{CP}$	Common side
$\Delta CAP \cong \Delta CBP$	$S.A.S. \cong S.A.S$
$\therefore \ \angle 1 \cong \angle 2$	Angle of congruent triangle
$m\angle 1 + m\angle 2 = 180^\circ$	Adjunction angles on one side of a line
Thus $m\angle 1 = m\angle 2 = 90^\circ$	
Hence $\overline{CP}$ is right bisector of $\overline{AB}$ and point C lies on $\overline{CB}$	