

LOCI AND CONCURRENCY THEOREMS

1. What is locus? Give an example.
2. Prove that the locus of a point equidistant from two given fixed points is the perpendicular bisector of the line segment joining the given points.
3. Prove that the locus of a point equidistant from two intersecting lines is the pair of lines bisecting the angles formed by the given lines.
4. $\triangle PBC$ and $\triangle QBC$ are two isosceles triangles on the same base BC. Show that line PQ bisects BC and is perpendicular to BC.

5. $\triangle PBC$, $\triangle QBC$ and $\triangle RBC$ are three isosceles triangles on the same base BC show that P, Q and R are collinear.

6. Find the locus of a point which is equidistant from these given non collinear points.
7. The bisectors of $\angle B$ and $\angle C$ of a quad. ABCD intersect at P. Show that P is equidistant from the opposite sides AB and CD.

8. In the fig. ABCD is a quadrilateral with $AB + BC$. If the perpendicular bisectors of AD and CD intersect at E, prove that BE bisects $\angle ABC$.

9. In the fig., sides AB and AC of $\triangle ABC$ have been produced to D and E respectively. The bisectors of $\angle CDB$ and $\angle ECB$ meet at G. Prove that the bisector of $\angle A$ passes through G.

10. In $\triangle ABC$, $\angle BAC = 90^\circ$. Prove that the perpendicular bisectors of AB and AC will meet at the midpoint of BC.