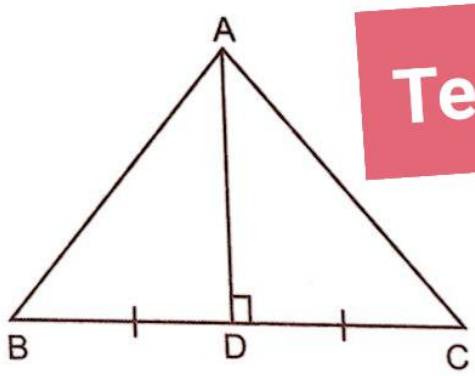
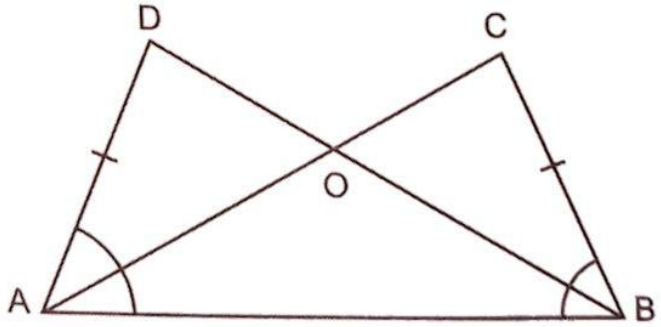
Exercise 13.1

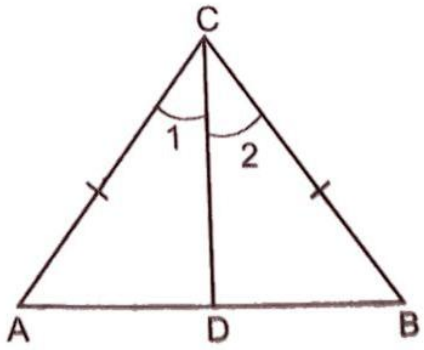
1. If $CD \perp AB$, and CD bisects AB, prove that ΔABC is an isosceles triangle.



2. In ΔABC and ΔABD, if $DA = CB$ and $\angle DAB = \angle CBA$, prove that ΔAOB is isosceles.

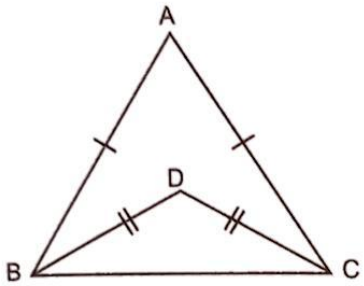


3. In ΔABC, if $AC = BC$ and CD bisects $\angle BCA$, prove that $\Delta ACD \cong \Delta BCD$.

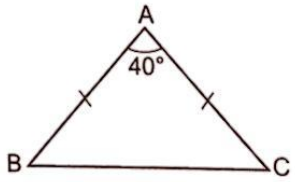


4. Suppose line segments AB and CD intersect at O in such a way that $AO = OD$ and $OB = OC$. Prove that $AC = BD$ but AC may not be parallel to BD.

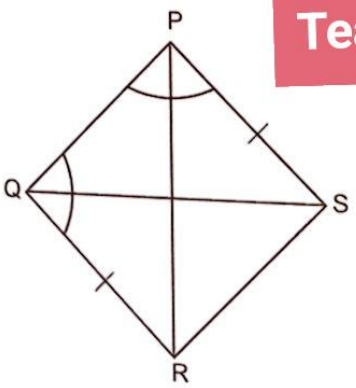
5. In the given figure, if AB = AC and DB = DC, then find $\frac{\angle ABD}{\angle DCA}$ [**Ans.** 1]



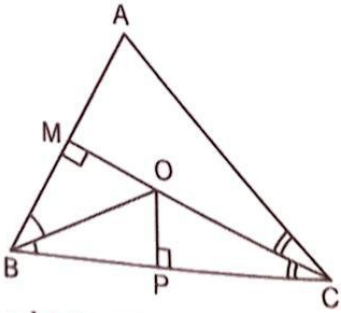
6. In the given figure, if AB = AC and $\angle A = 40°$, then find $\angle C$. [**Ans.** 70°]



7. In the given figure, PS = QR and $\angle SPQ = \angle RQP$. Prove that PR = QS and $\angle QPR = \angle PQS$.

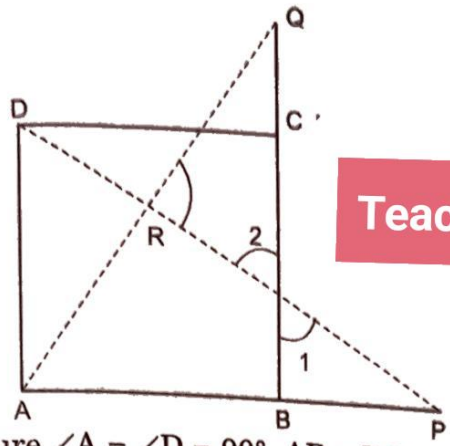


8. In the given figure, BO and CO are the bisectors of the angles $\angle B$ and $\angle C$ of a ΔABC. If $OP \perp BC$ and $OM \perp AB$, prove that
   (*i*) $\Delta BOM \cong \Delta BOP$
   (*ii*) OP = OM

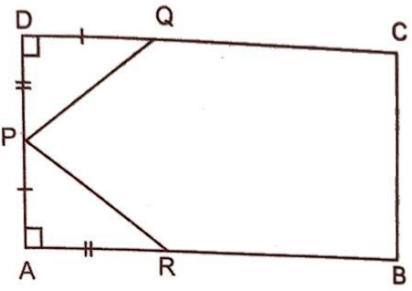


9. PQR is a triangle in which PQ = PR. S and T are points on PQ and PR such that QT and RS are respectively the bisectors of $\angle PQR$ and $\angle QRP$. Prove that $\Delta TQR \cong \Delta SRQ$.

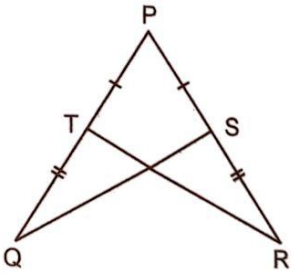
10. The sides AB and BC of a square ABCD are produced to P and Q respectively so that BP = CQ. Prove that PD and AQ are equal and perpendicular to each other.



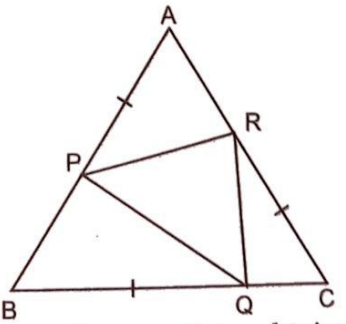
11. In the given figure $\angle A = \angle D = 90°$, AP = DQ and AR = PD. Prove that PQ = PR.



12. In the given figure, PT = PS and TQ = SR. Prove that QS = RT.



13. ΔABC is an equilateral triangle. P, Q, R are points on sides AB, BC and CA respectively such that AP = BQ = CR. Prove that PQ = QR = RP.



14. Prove that the medians of an equilateral triangle are equal.
15. Given two congruent triangles, prove that the bisector of one triangle is congruent in the corresponding angle bisector of the other triangle.

16. ABC is an equilateral triangle. Points P, Q, R are taken on the sides AB, BC and CA respectively such that AP = BQ = CR. Prove that ΔPQR is also an equilateral triangle.