Properties of Triangles

Exercise 1:

Solution 1:

In ΔABC,

1. Segment CD is the altitude on side AB.
2. Segment AF is the altitude on side BC.
3. Segment BE is the altitude on side AC.

Solution 2:

1. In ΔKLP, seg KN is an altitude.
2. In ΔKLP, seg KM is a median.

Solution 3:

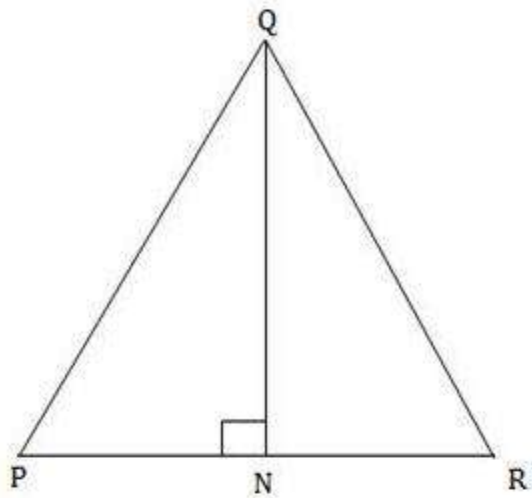
1. Point D is the midpoint of seg VW.
2. l(VW) = 2 × l(VD) = 2 × 5 = 10 cm

Solution 4:

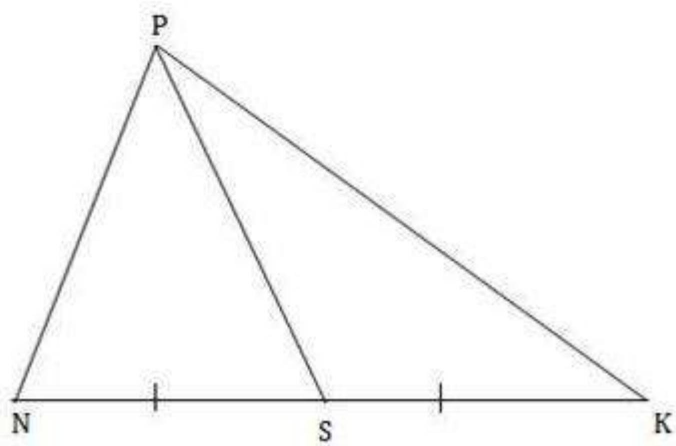
Yes, segment PD can be the altitude as well as the median of ΔPQR.
Reason:
Given, segment PD is the perpendicular drawn from vertex P to the opposite side QR.
D is the midpoint of segment QR. So, PD is the median of ΔPQR.
∴ Segment PD is the median as well as the altitude of ΔPQR.

Solution 5:

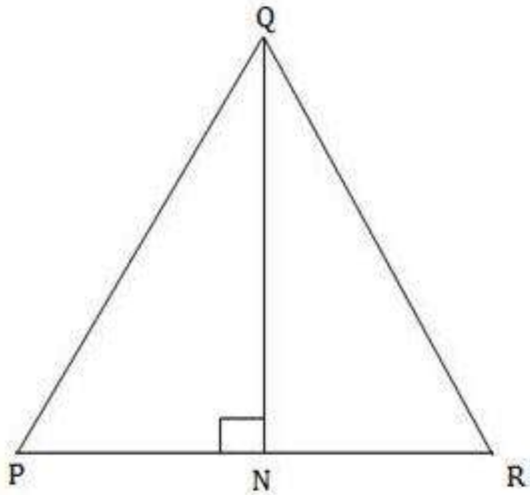
1. In ΔPQR, seg QN is an altitude.



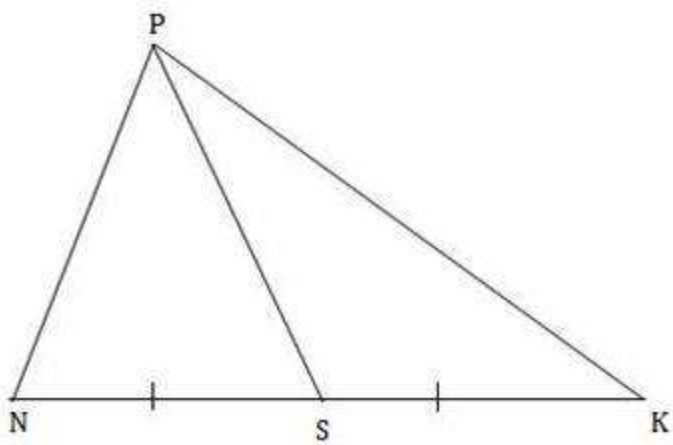
2. In ΔNPK, seg PS is a median.



1. In ΔPQR, seg QN is an altitude.



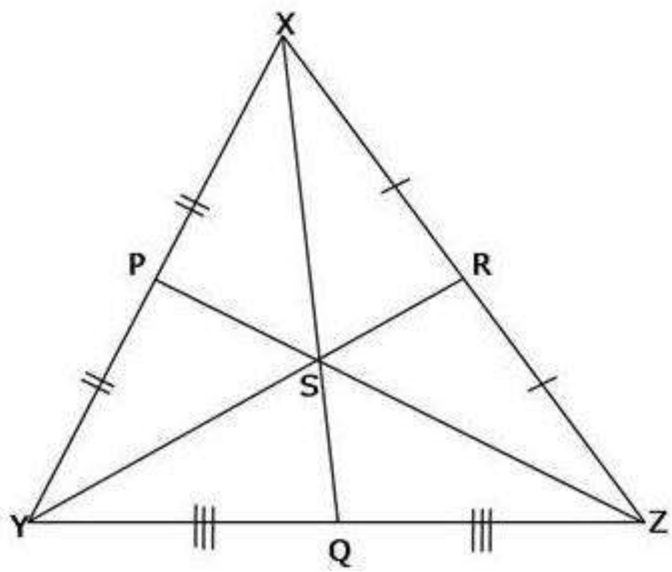
2. In ΔNPK, seg PS is a median.



Solution 6:

The median is the line segment joining the vertex of a triangle and the midpoint of its opposite side.
Steps of construction:

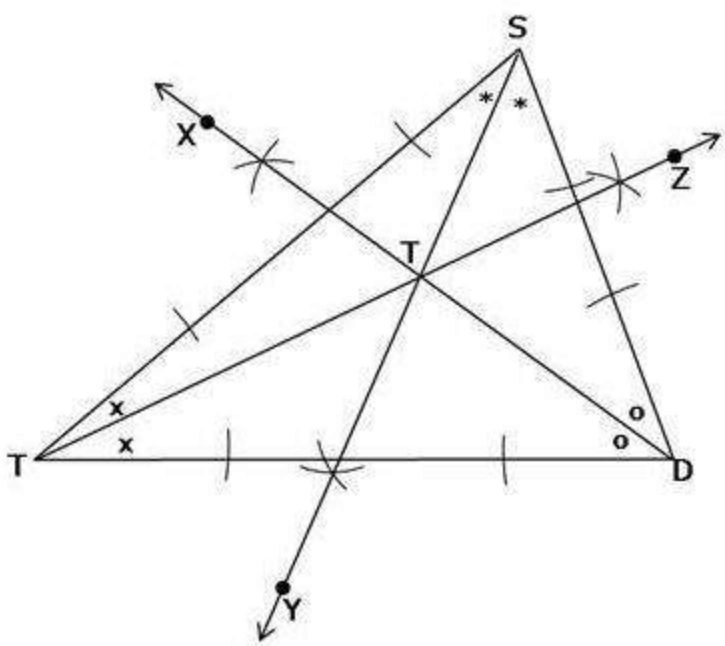
1. Draw any ΔXYZ.
2. Construct the bisector of each side of the triangle to find the midpoints of each of the sides of ΔXYZ.
3. Hence, P, Q and R are the midpoints of the sides XY, YZ and ZX of ΔXYZ respectively.
4. Join the vertex X to the midpoint Q of its opposite side YZ.
5. Similarly, join R and Y, P and Z.



Thus, seg XQ, seg YR and seg ZP are the three medians of ΔXYZ.

Solution 7:
The angle bisectors divide the given angle into two equal angles.
Steps of construction:

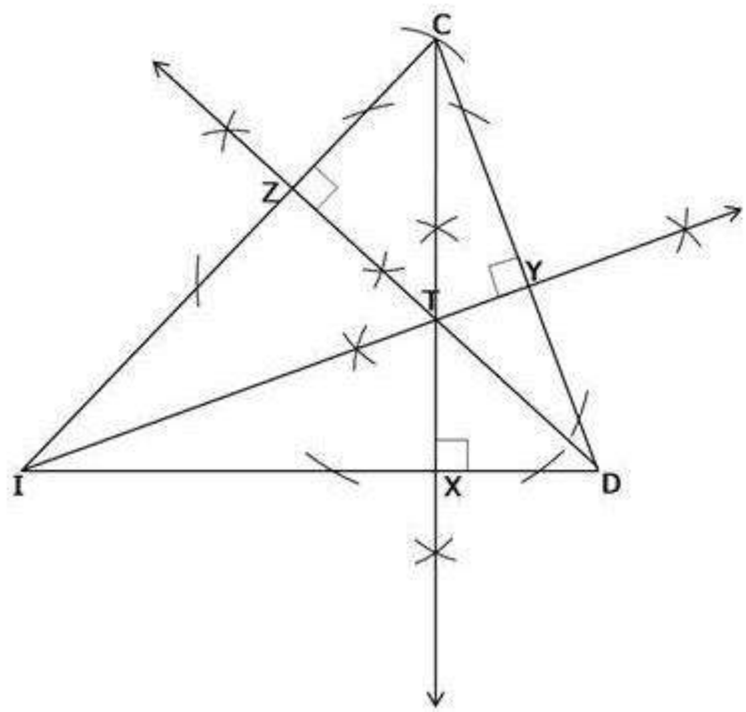
1. Draw any ΔSTD.
2. Construct the angle bisectors of each of the angles of ΔSTD.



Hence, SY, DX and TZ are the three angle bisectors of ΔSTD.

Solution 8:

1. Draw any ΔCID.
2. Construct the perpendicular bisectors of each of the sides of ΔCID.

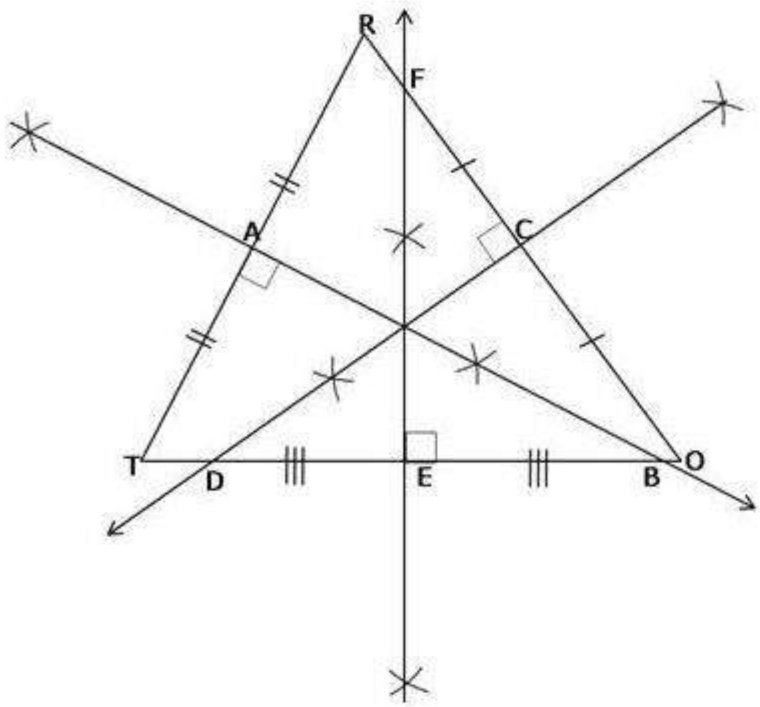


Thus, seg DZ, seg CX and seg IY are the three perpendicular bisectors of ΔCID.

Solution 9:

Steps of construction:

1. Draw any ΔRTO.
2. Construct the perpendicular bisectors of each of the sides of the triangle to find the midpoint of each of the sides of ΔRTO.
3. Hence, A, C and E are the midpoints of the sides TR, RO and OT of ΔRTO.
4. Construct the perpendicular bisectors from the midpoints of the three sides of ΔRTO.



Hence, AB, FE and CD are the three perpendicular bisectors of ΔRTO.