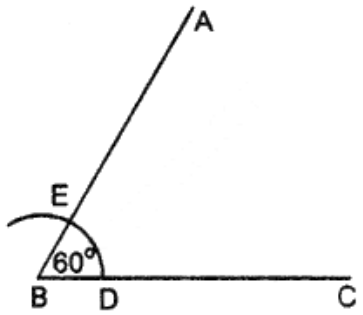
Board – ICSE	Class – 8th	Topic – Constructions

1. Draw a line segment BC = 4 cm. Construct angle ABC = 60°.

Solutions :

Steps of Construction:

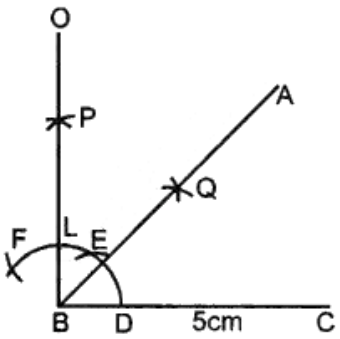


1. Draw a line segment BC = 4 cm
2. With B as a centre, draw an arc of any suitable radius which cuts BC at point D.
3. With D as a centre, and the same radius as in step 2 , draw one more arc which cuts the previous arc at point E.
4. Join BE and produce it to point A.
   Thus ∠ABC = 60°

2. Construct angle ABC = 45° in which BC = 5 cm and AB = 4.6 cm.

Solutions :

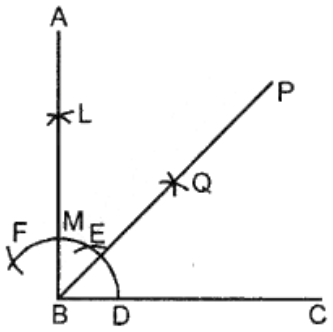
Steps of Construction :



1. Draw a line segment BC = 5 cm
2. Taking B as centre, draw an arc of any suitable radius, which cuts BC at the point D.
3. With D as the centre and the same radius, as taken in step 2 , draw an arc which cuts the previous arc at point E.
4. With E as the centre and the same radius, draw one more arc which cuts the first arc at point F.
5. With E and F as centres and radii equal to more than half the distance between E at F, draw an arc which cut each other at point P.
6. Join BP to meet EF at L and produce to point O. Then ∠OBC = 90°
7. Draw BA, the bisector of angle OBC. [With D, L as centres and suitable radius draw two arcs meeting each other at Q produced it to R]
   ⇒ ∠ABC = 45°[∴ BA is bisector of ∠OBC ∴ ∠ABC = 45°]
8. From BR cut arc AB = 4.6 cm

3. Construct angle ABC = 90°. Draw BP, the bisector of angle ABC. State, the measure of angle PBC.

Solution :



Draw ∠ABC = 90°

Draw bisector of ∠ABC

Then ∠PBC = $\frac{1}{2}(90°) = 45°$

4. Draw angle ABC of any suitable measure.

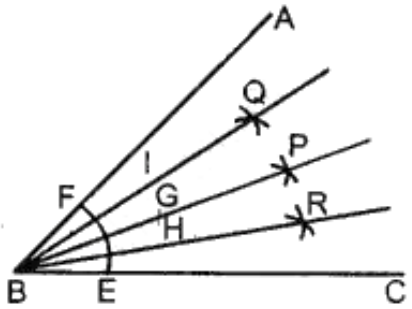
(i) Draw BP, the bisector of angle ABC.

(ii) Draw BR, the bisector of angle PBC and draw BQ, the bisector of angle ABP.

(iii) Are the angles ABQ, QBP, PBR and RBC equal?

(iv) Are the angles ABR and QBC equal?

Solutions :



Steps of Construction:

1. Construct any angle ABC
2. With B as a centre, draw an arc EF meeting BC at E and AB at F.
3. With E, F as centres draws two arcs of equal radii meeting each other at the point P.
4. Join BP. Then BP is the bisector of ∠ABC

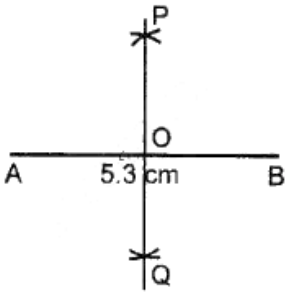
$$\angle ABP = \angle PBC = \angle ABC$$

5. Similarly draw BR, the bisector of ∠PBC and draw BQ as the bisector of ∠ABP [With the same method as in steps 2,3]
6. Then ∠ABQ = ∠QBP = ∠PBR = ∠RBC
7. ∠ABR = ∠ABC and ∠QBC = ∠ABC ∠ABR = ∠QBC

5. Draw a line segment AB of length 5.3 cm. Using two different methods bisect AB.

Solution :

First method



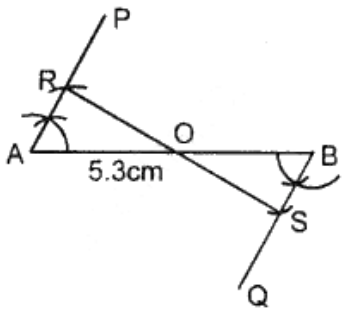
Steps of Construction:

1. Draw a line segment AB = 5.3 cm
2. With A as centre and radius equal to more than half of AB, draw arcs on both sides of AB.
3. With B as the centre and with the same radius as taken in step 2 , draw arcs on both sides of AB.

4. Let the arcs intersect each other at points P and Q.
5. Join P and Q.
6. The line PQ cuts the given line segment AB at point O.
   Thus, PQ is a bisector of AB such that

$$OA = OB = \frac{1}{2}AB$$

Second method

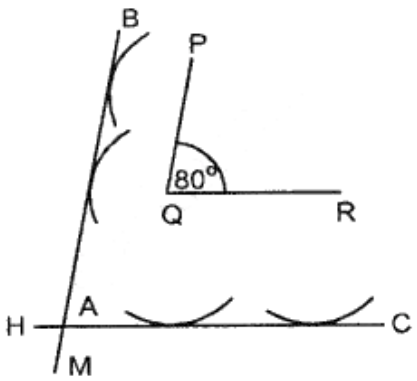


Steps of Construction:

1. Draw the given line segment AB = 5.3 cm.
2. At A, construct ∠PAB of any suitable measure. Then ∠PAB = 60° construct ∠QBA = 60°
3. From AP, cut AR of any suitable length and from BQ; cut BS = AR.
4. Join R and S
5. Let RS cut the given line segment AB at the point O.
   Thus RS is a bisector of AB such that $OA = OB = \frac{1}{2}AB$

6. Construct an angle PQR = 80°. Draw a line parallel to PQ at a distance of 3 cm from it and another line parallel to QR at a distance of 3.5 cm from it. Mark the point of intersection of these parallel lines as A.

Solution :

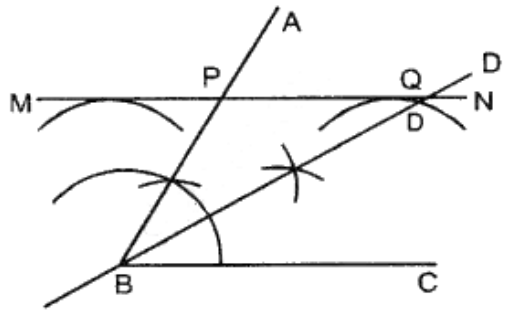


Steps of construction:

1. Draw ∠PQR = 80°
2. With P as centre draw an arc of radius 2 cm.
3. Again with Q as a centre, draw another arc of radius 2 cm. Then BM is a line which touches the two arcs. Then BM is a line parallel to PQ.
4. With Q as a centre, draw an arc of radius 3.5 cm. With R as centre draw another arc of radius 3.5 cm. Draw a line HC which touches these two arcs. Let these two parallel lines intersect at A.

7. Draw an angle ABC = 60°. Draw the bisector of it. Also, draw a line parallel to BC a distance of 2.5 cm from it. Let this parallel line meet AB at point P and angle bisector at point Q. Measure the length of BP and PQ. Is $BP = PQ$?

Solution :



Steps of construction :

1. Draw, $\angle ABC = 60°$
2. Draw BD, the bisector of $\angle ABC$.
3. Taking B as centre, draw an arc of radius 2.5 cm.
4. Taking C as a centre, draw another arc of radius 2.5 cm.
5. Draw a line MN that touches these two arcs drawn. Then MN is the required line parallel to BC.
6. Let this line MN meets AB at P and bisector BD at Q.
7. Measure BP and PQ.
   By measurement, we see $BP = PQ$.