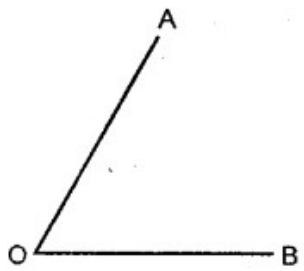
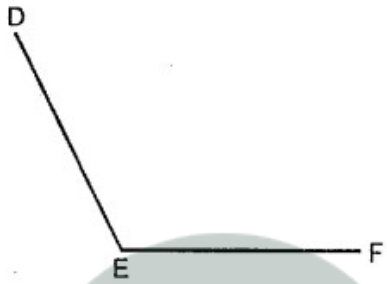
Question 1.

In your note-book copy the following angles using ruler and a pair compass only.

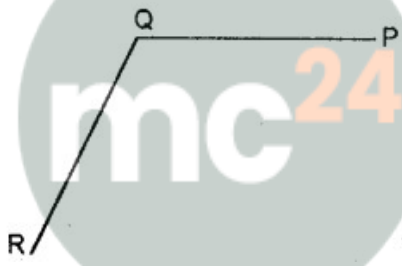
(*i*)



(*ii*)



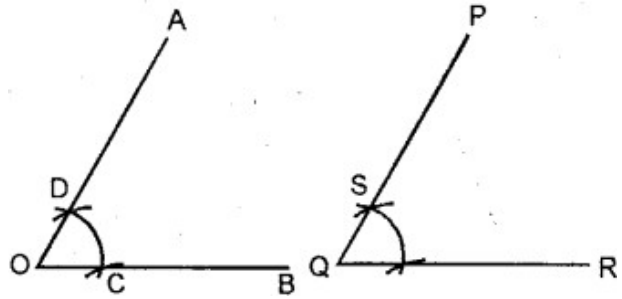
(*iii*)



Solution:

(i) Steps of Construction :

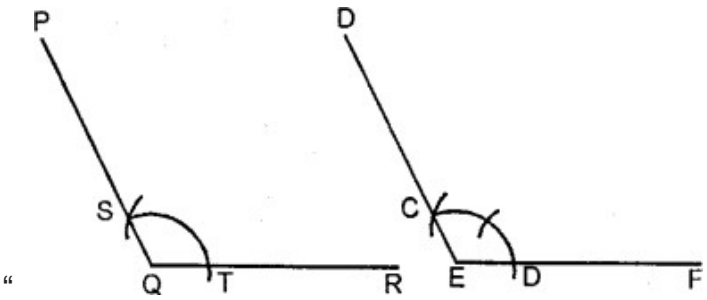
1. At point Q, draw line QR = OB.



2. With O as centre, draw an arc of any suitable radius, to cut the arms of the angle at C and D.
3. With Q as centre, draw the arc of the same size as drawn for C and D. Let this arc cuts line QR at point T.
4. In your compasses, take the distance equal to distance between C and D; and then with T as centre, draw an arc which cuts the earlier arc at S.
5. Join QS and produce upto a suitable point P. ∠PQR so obtained, is the angle equal to the given ∠AOB.

(ii) Steps of Construction :

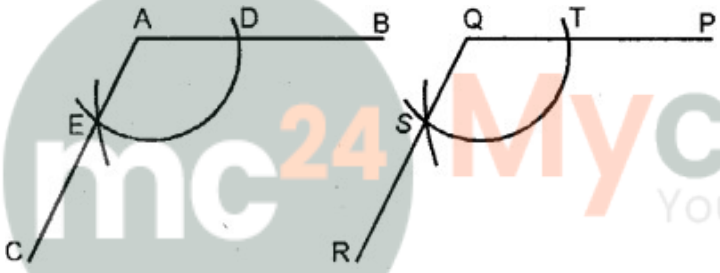
1. A t point E, draw line EF.



2. With E as centre, draw an arc of any suitable radius, to cut the amis of the angle at C and D.
3. With Q as centre, draw the arc of the same size as drawn for C and D. Let this arc cuts line QR at point T.
4. In your compasses, take the distance equal to distance between C and D ; and then with T as centre, draw an arc which cuts the earlier arc at S.
5. Join QS and produce upto a suitable point R ∠PQR, so obtained, is the angle equal to the given ∠DEE

(iii) Steps of Construction :

1. At point A draw line AB = QP



2. With Q as centre, draw an arc of any suitable radius, to cut the arms of the angle A + C and D.
3. With A as centre, draw the arc of the same size as drawn for C and D. Let this arc cuts line AB at D.
4. In your compasses, take the distance equal to distance between 7 and 5 ; and then with D as centre, draw an arc which cuts the earlier arc at E.
5. Join AE and produced upto a suitable point C. ∠BAC, so obtained is the angle equal to the given ∠PQR.

Question 2.

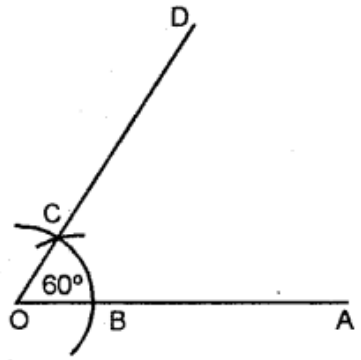
Construct the following angles, using ruler and a pair of compass only

(i) 60°
(ii) 90°
(iii) 45°
(iv) 30°
(v) 120°
(vi) 135°
(vii) 15°

Solution:

(*i*) **Steps of Construction :**

To Construct an angle of 60°.

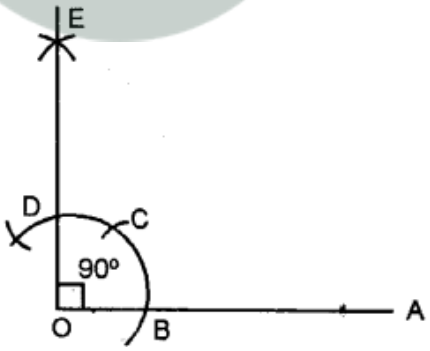


1. Draw a line OA of any suitable length.
2. At O, draw an arc of any size to cut OA at B.
3. With B as centre, draw the same size arc, to cut the previous arc at C.
4. Join OC and extend upto a suitable point D. Then, $\angle DOA = 60°$.

(*ii*) **Steps of Construction :**

To construct an angle of 90°.

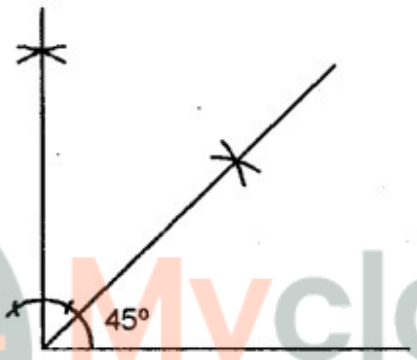
Let OA be a line and at point O, 90° angle is to be drawn.



1. With O as centre, draw an arc to cut OA at B.
2. With B as centre, draw the same size arc to cut the previous arc at C.
3. Again with C as centre and with the same radius, draw one more arc to cut the first arc at D.

4. With C and D as centres, draw two arcs of equal radii to cut each other at point E.
5. Join O and E. Then, $\angle AOE = 90°$.

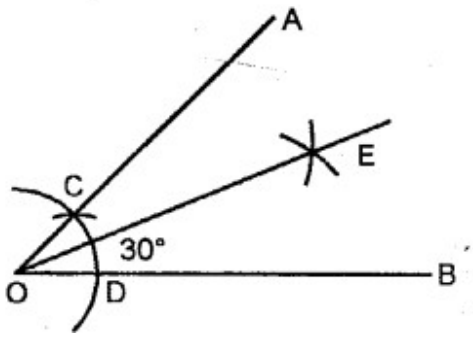
(*iii*) Draw an angle of 90° as in question (*ii*) and bisect it. Each angle so obtained will be 45°.



(*iv*) **Steps of Construction :**

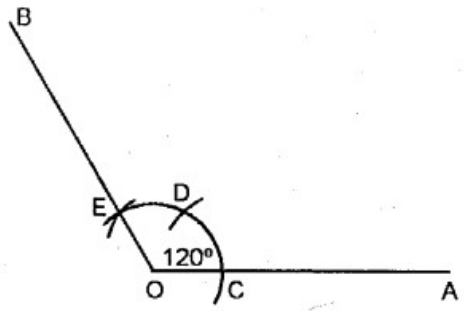
To construct an angle of 30°.

1. Draw an angle of 60° as drawn as in Q. No. (*i*).
2. Bisect this angle of get two angles each of 30°. Thus, $\angle EOB = 30°$.



(*v*) **Steps of Construction :**

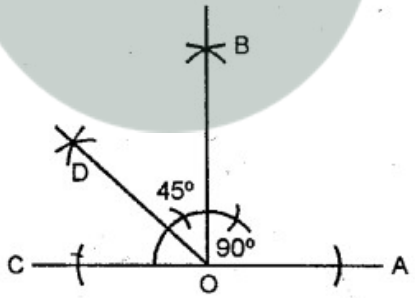
To construct an angle of 120°.



1. With centre O on the line OA, draw an arc to cut this line at C.
2. With C as centre, drawn a same size arc which cuts the first arc at point D.
3. With D as centre, draw one more arc of same size which cuts the first arc at E.
4. Join OE and produce it upto point B. Then, $\angle AOB = 120°$.

(*vi*) **Steps of Construction :**

To construct an angle of 135°.



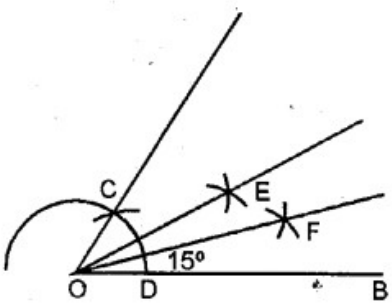
1. Draw an angle $BOA = 90°$ at point O of given line AC
2. Bisect the angle BOC on the other side of OB, which is also 90°.

   Thus, $\angle BOD = \angle COD = 45°$

   And, $\angle AOD = 90° + 45° = 135°$.

(*vii*) **Steps of Construction :**

To construct an angle of 15°.



1. Draw an angle of 60° as drawn above.
2. Bisect this angle of get two angles each of 30°. Thus, ∠EOB = 30°.
3. Bisect this angle ∠EOB to get two angles each of 15°. ∠EOB = 15°.

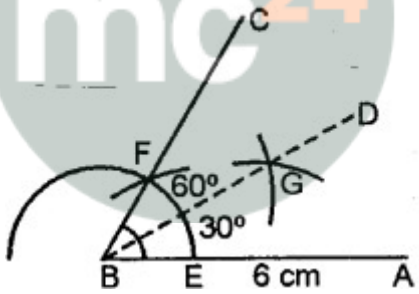
Question 3.

Draw line AB = 6cm. Construct angle ABC = 60°. Then draw the bisector of angle ABC.

Solution:

Steps of Construction :

1. Draw a line segment AB = 6 cm.



2. With the help of compass construct ∠CBA = 60°.
3. Bisect ∠CBA, with the help of compass, take any radius which meet line AB and BC at point E and F.
4. Now, with the help of compass take radius more than $\frac{1}{2}$ of EF and draw two arcs from point E and F, which intersect both arcs at G, proceed BG toward D ∠DBA is bisector of ∠CBA.

Question 4.

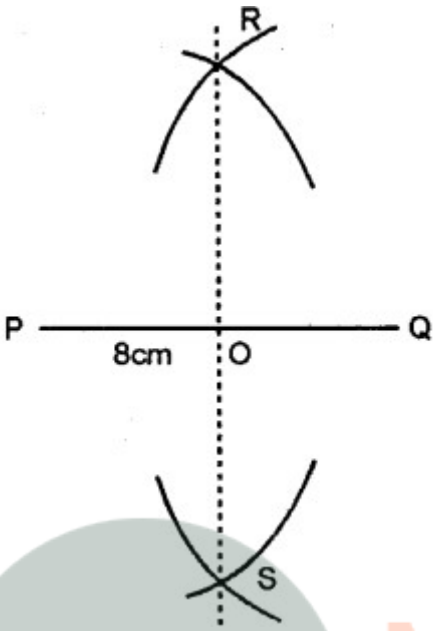
Draw a line segment PQ = 8cm. Construct the perpendicular bisector of the line segment PQ. Let the perpendicular bisector drawn meet PQ at point R. Measure the lengths of PR and QR. Is PR = QR ?

Solution:

Steps of Construction :

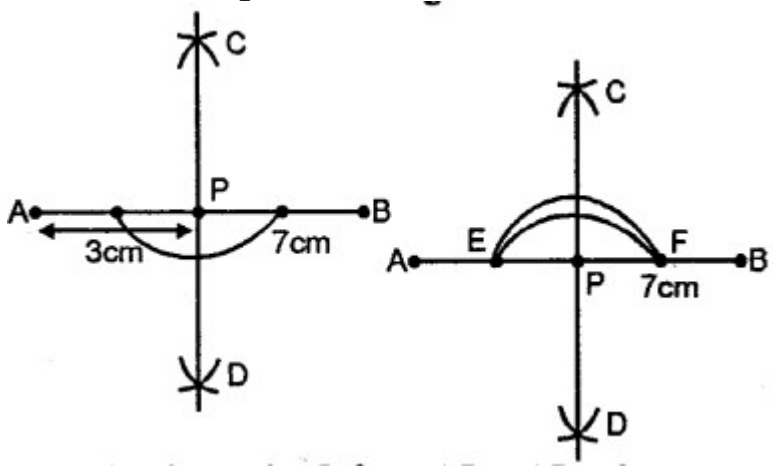
1. With P and Q as centres, draw arcs on both sides of PQ with equal radii. The radius

should be more than half the length of PQ.
2. Let these arcs cut each other at points R and RS
3. Join RS which cuts PQ at D.
Then RS = PQ Also ∠POR = 90°.



Hence, the line segment RS is the perpendicular bisector of PQ as it bisects PQ at P and is also perpendicular to PQ. On measuring the lengths of PR = 4cm, QR = 4 cm
Since PR = QR, both are 4cm each
∴PR = QR.

Question 5.
Draw a line segment AB = 7cm. Mark a point Pon AB such that AP=3 cm. Draw perpendicular on to AB at point P.
Solution:
1. Draw a line segment AB = 7 cm.



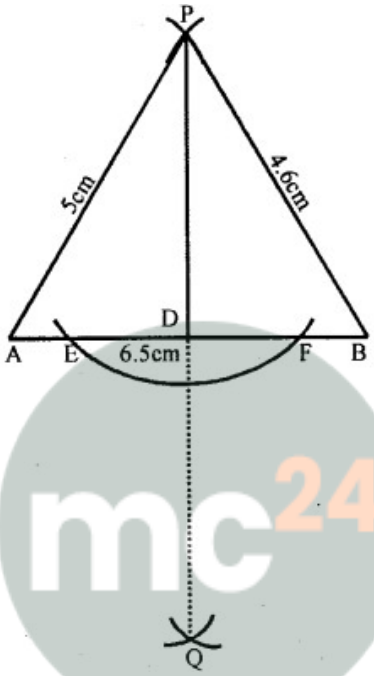
2. Out point from AB – AP =3cm
3. From point P, cut arc on out side of AB, E and F.

4. From pont E & F cut arcs on both side intersection each other at C & D.
5. Join point P, CD.
6. Which is the required perpendicular.

Question 6.

Draw a line segment AB = 6.5 cm. Locate a point P that is 5 cm from A and 4.6 cm from B. Through the point P, draw a perpendicular on to the line segment AB.

Solution:



Steps of Construction :

(i) Draw a line segment AB =6.5cm
(ii) With centre A and radius 5 cm, draw an arc and with centre B and radius 4.6 cm, draw another arc which intersects the first arc at P.
Then P is the required point.
(iii) With centre A and a suitable radius, draw an arc which intersect AB at E and F.
(iv) With centres E and F and radius greater than half of EF, draw the arcs which intersect each other at Q.
(v) Join PQ which intersect AB at D.
Then PD is perpendicular to AB.