

**EXERCISE 19.6**

**PAGE: 19.15**

**1. Construct an angle of  $60^\circ$  with the help of compasses and bisect it by paper folding.**

**Solution:**

Construct a ray OA

Taking O as centre and convenient radius, construct an arc which cuts the ray OA at the point P.

Taking P as centre and same radius, construct another arc which cuts the previous arc at the point Q.

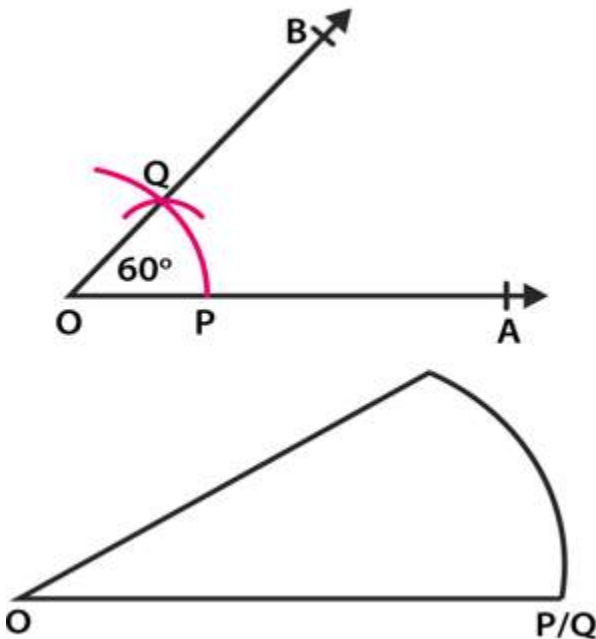
Construct OQ and extend it to the point B.

Here,  $\angle AOB$  is the required angle of  $60^\circ$

Now cut the part of paper as sector OPQ

Fold the part of paper such that the line segments OP and OQ coincides.

The angle which is made at point O is the required angle which is half of  $\angle AOB$ .



**2. Construct the following angles with the help of ruler and compasses only:**

(i)  $30^\circ$

(ii)  $90^\circ$

(iii)  $45^\circ$

(iv)  $135^\circ$

(v)  $150^\circ$

(vi)  $105^\circ$

**Solution:**

(i)  $30^\circ$

Construct a ray OA.

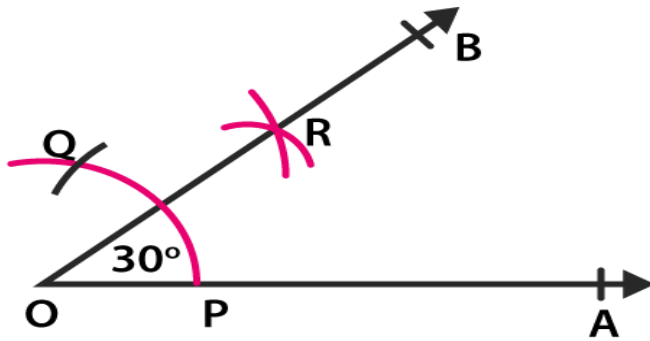
Taking O as centre and with convenient radius, construct an arc which cuts OA at the point P.

Taking P as centre and same radius, construct an arc which cuts the previous arc at the point Q.

Considering P and Q as centres and radius which is more than half of PQ construct two arcs which cuts each other and name it as point R.

Construct OR and extend it to the point B.

Here,  $\angle AOB$  is the required angle of  $30^\circ$



(ii)  $90^\circ$

Construct a ray OA.

Taking O as centre and with convenient radius, construct an arc which cuts OA at the point P.

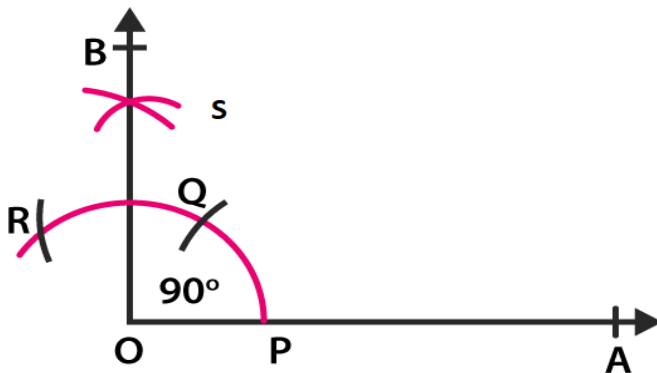
Taking P as centre and same radius, construct an arc which cuts the previous arc at the point Q.

Taking Q as centre and same radius, construct an arc which cuts the previous arc at the point R.

Considering Q and R as centres and radius which is more than half of QR construct two arcs which cuts each other and name it as point S.

Construct OS and extend it to the point B from the ray OB.

Here,  $\angle AOB$  is the required angle of  $90^\circ$ .



(iii)  $45^\circ$

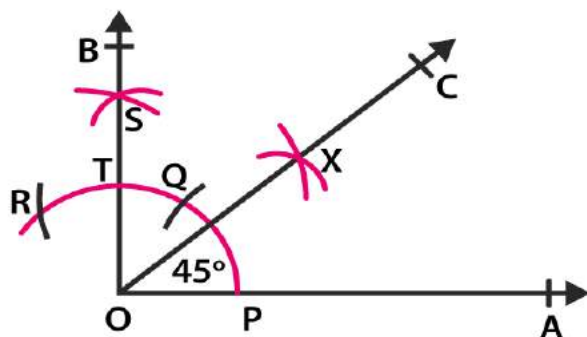
In order to draw an angle of  $45^\circ$ , construct an angle of  $90^\circ$  and bisect it.

Construct  $\angle AOB = 90^\circ$  where OA and OB are the rays which intersect the arc at the points P and T

Taking P and T as centres and radius which is more than half of PT, construct two arcs which cuts each other and name it as point X

Construct OX and extend it to the point C to form the ray OC

Here,  $\angle AOC$  is the required angle of  $45^\circ$ .



(iv)  $135^\circ$

Construct a line AB and mark a point O in the middle of AB.

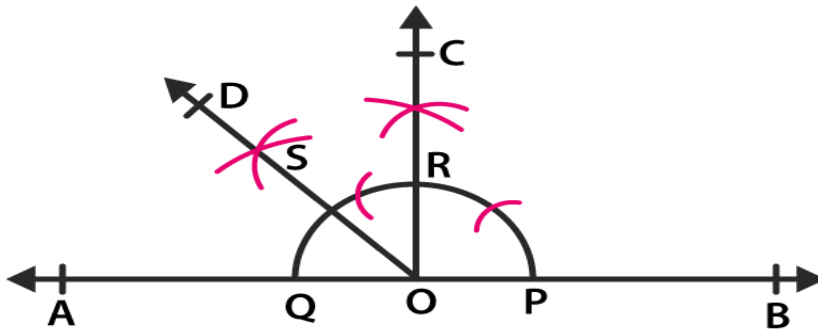
Taking O as centre and convenient radius, construct an arc which cuts the line AB at the points P and Q.

Construct an angle of  $90^\circ$  on the ray OB as  $\angle BOC = 90^\circ$  where OC cuts the arc at the point R

Taking Q and R as centres and radius which is more than half of QR, construct two arcs which cuts each other and name it as point S.

Construct OS and extend it to the point D to form the ray OD.

Here,  $\angle BOD$  is the required angle of  $135^\circ$ .



(v)  $150^\circ$

Construct a line AB and mark a point O in the middle of AB.

Taking O as centre and convenient radius construct an arc which cuts the line AB at the points P and Q.

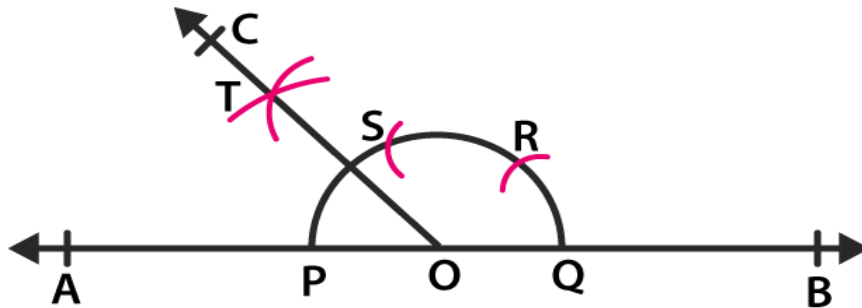
Taking Q as centre and same radius construct an arc which cuts the previous arc and name it as point R.

Taking R as centre and same radius construct an arc which cuts the previous arc and name it as point S.

Taking P and S as centres and radius which is more than half of PS, construct two arcs which cuts each other and name it as point T.

Construct OT and extend it to the point C to form the ray OC.

Here,  $\angle BOC$  is the required angle of  $150^\circ$ .

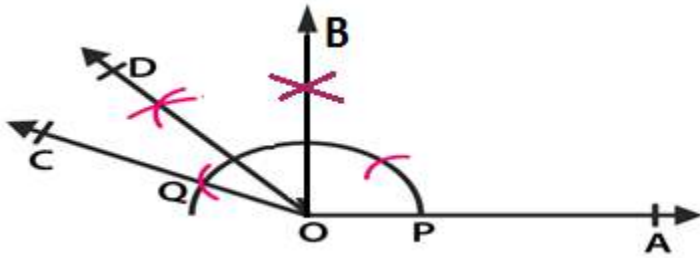


(vi)  $105^\circ$

Construct a ray OA and make  $\angle AOB = 90^\circ$  and  $\angle AOC = 120^\circ$

Bisect  $\angle BOC$  and get the ray OD.

Here,  $\angle AOD$  is the required angle of  $105^\circ$ .



3. Construct a rectangle whose adjacent sides are 8 cm and 3 cm.

**Solution:**

Construct a line segment AB of length 8 cm.

Draw  $\angle BAX = 90^\circ$  at A and  $\angle ABY = 90^\circ$  at B

With the help of compass and ruler, mark a point D on the ray AX where AD = 3 cm

In the same way mark the point C on the ray BY where BC = 3 cm

Construct the line segment CD

Hence, ABCD is the required rectangle.

