

Board –CBSE

Class – 6<sup>th</sup>

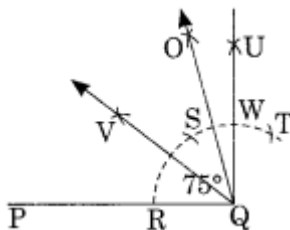
Topic – Practical Geometry Ex: 14.6

### Exercise 14.6

1. Draw  $\angle POQ$  of measure  $75^\circ$  and find its line of symmetry.

**Ans.** Step I: Draw a line segment  $\overline{PQ}$ .

Step II: With center Q and suitable radius, draw an arc to cut PQ at R.



Step III: With center R and radius of the same length, mark S and T on the former arc.

Step IV: With centers S and T and with the same radius, draw two arcs that meet each other at U.

Step V: Join QU such that  $\angle PQU = 90^\circ$ .

Step VI: With centers S and W, draw two arcs of the same radius which meet each other at Q.

Step VII: Join Q and O such that  $\angle PQO = 75^\circ$ .

Step VIII: Bisect  $\angle PQQ$  with QV.

Thus, OV is the line of symmetry of  $\angle PQO$ .

2. Draw an angle of measure  $147^\circ$  and construct its bisector.

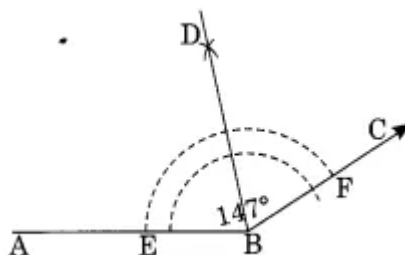
**Ans.** Step I: Draw  $\angle ABC = 147^\circ$  with the help of a protractor.

Step II: With centers B and radius of proper length, draw an arc that meets AB and AC at E and F respectively.

Step III: With centers E and F and the radius more than half of the length of arc EF, draw two arcs which meet each other at D.

Step IV: Join B and D.

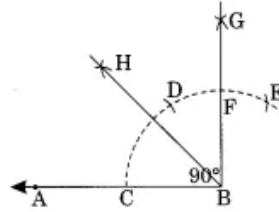
Thus, BD is the bisector of  $\angle ABC$ .



3. Draw a right angle and construct its bisector.

**Ans.** Step I: Draw a line segment AB.

Step II: With center B and proper radius draw an arc to meet AB at C.



Step III: With center C and same radius, mark two marks D and E on the former arc.

Step IV: With centers D and E and the same radius, draw two arcs that meet each other at G.

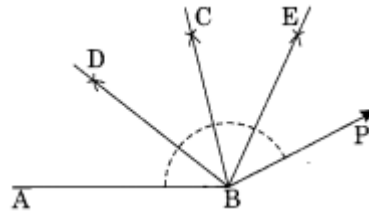
Step V: Join B and G such that  $\angle ABG = 90^\circ$

Step VI: Draw BH as the bisector of  $\angle ABG$  such that  $\angle ABH = 45^\circ$ .

Thus  $\angle ABG$  is the right angle and BH is the bisector of  $\angle ABG$ .

4. Draw an angle of  $153^\circ$  and divide it into four equal parts.

**Ans.** Step I: Draw  $\angle ABP = 153^\circ$  with the help of a protractor.



Step II: Draw BC as the bisector of  $\angle ABP$  which divides  $\angle ABP$  into two equal parts.

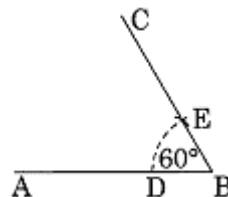
Step III: Draw BD and BE as the bisector of  $\angle ABC$  and  $\angle CBP$  respectively.

Thus, the bisectors BD, BC, and BE divide  $\angle ABP$  into four equal parts.

5. Construct with ruler and compasses, angles of the following measures:

- (a)  $60^\circ$                       (b)  $30^\circ$                       (c)  $90^\circ$                       (d)  $120^\circ$   
 (e)  $45^\circ$                       (f)  $135^\circ$

**Ans.** (a) Angle of  $60^\circ$

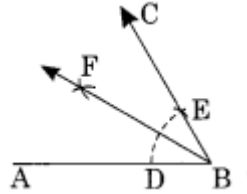


Step I: Draw a line segment  $\overline{AB}$ .

Step II: With center B and proper radius draw an arc.

Step III: With center D and radius of the same length, mark a point E on the former arc.  
 Step IV: Join B to E and produce to C. Thus  $\angle ABC$  is the required angle of measure  $60^\circ$ .

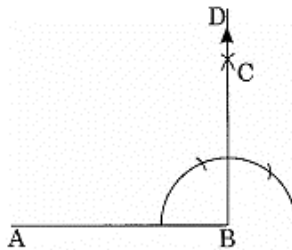
(b) Step I: Draw  $\angle ABC = 60^\circ$  as we have done in section (a).  
 Step II: Draw BF as the bisector of  $\angle ABC$ .



Thus  $\angle ABF = \frac{60}{2} = 30^\circ$ .

(c) Angle of  $90^\circ$

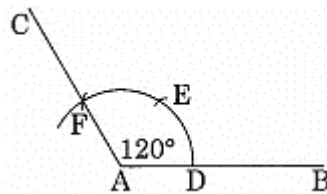
In the given figure,  
 $\angle ABC = 90^\circ$  (Refer to solution 3)



(d) Angle of  $120^\circ$ .

Step I: Draw  $\overline{AB}$

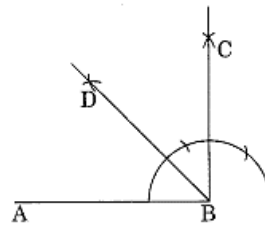
Step II: With center A and radius of proper length, draw an arc.



Step III: With center D and the same radius, draw two marks E and F on the former arc.  
 Step IV: Join A to F and produce to C. Thus  $\angle CAB = 120^\circ$

(e) Angle of  $45^\circ$ , i.e.,  $\frac{90}{2} = 45^\circ$

In the figure  $\angle ABD = 45^\circ$  (Refer to solution 3)

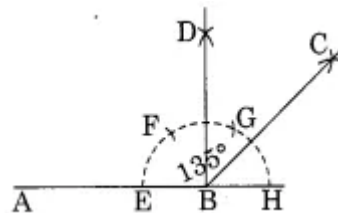


(f) An angle of  $135^\circ$

Since  $135^\circ = 90^\circ + 45^\circ$

$$= 90^\circ + \left(\frac{90}{2}\right)^\circ$$

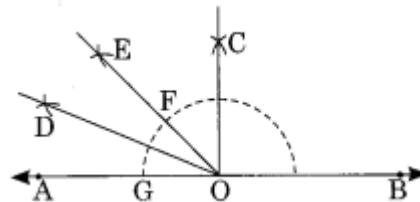
In this figure  $\angle ABC = 135^\circ$



6. Draw an angle of measure  $45^\circ$  and bisect it.

**Ans.** Step I: Draw a line AB and take any point O on it.

Step II: Construct  $\angle AOE = 45^\circ$  at O.



Step III: With center O and proper radius, draw an arc GF.

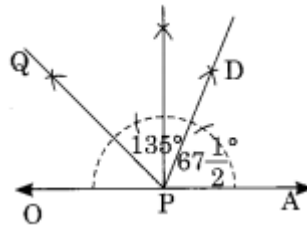
Step IV: With centers G and F and proper radius, draw two arcs that intersect each other at D.

Step V: Join O to D.

Thus  $\angle AOE = 45^\circ$  and OD is its bisector.

7. Draw an angle of measure  $135^\circ$  and bisect it.

**Ans.** Steps I: Draw a line OA and take any point P on it.



Step II: Construct  $\angle APQ = 135^\circ$ .

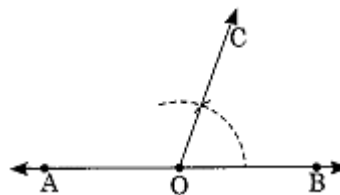
Step III: Draw PD as the bisector of angle APQ.

$$\text{Thus } \angle APQ = \frac{135^\circ}{2} = 67 \frac{1}{2}^\circ.$$

8. Draw an angle of  $70^\circ$ . Make a copy of it using only a straight edge and compasses.

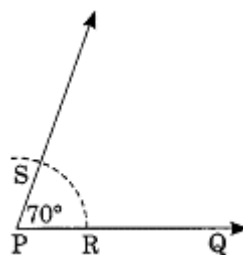
**Ans.** Step I: Draw a line AB and take any point O on it.

Step II: Draw  $\angle COB = 70^\circ$  using a protractor.



Step III: Draw a ray  $\overrightarrow{PQ}$ .

Step IV: With center O and proper radius, draw an arc that meets  $\overline{OA}$  and  $\overline{OB}$  at E and F respectively.



Step V: With the same radius and center at P, draw an arc meeting  $\overline{PQ}$  at R.

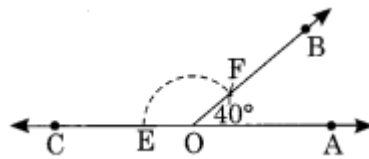
Step VI: With center R and keeping and radius equal to EF, draw an arc intersecting the former arc at S.

Step VII: Join P and S and produce it. Thus, QPS is the copy of  $\angle AOB = 70^\circ$ .

9. Draw an angle of  $40^\circ$ . Copy its supplementary angle.

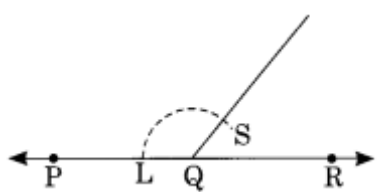
**Ans.** Step I: Construct  $\angle AOB = 40^\circ$  using a protractor.

$\angle COF$  is the supplementary angle of  $\angle AOB$ .



Step II: Draw a ray  $\overrightarrow{PR}$  and take any point Q on it.

Step III: With center O and proper radius, draw an arc that intersects  $\overline{OC}$  and  $\overline{OB}$  at E and F respectively.



Step IV: With center Q and the same radius, draw an arc that intersects  $\overline{PQ}$  at L.

Step V: With center L and radius equal to EF, draw an arc that intersects the former arc at S.

Step VI: Join Q and S and produce.

Thus,  $\angle PQS$  is the copy of the supplementary angle COB.,