

Board – CBSE

Class – 6th

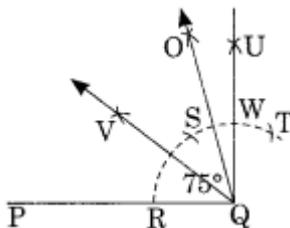
Topic – Practical Geometry Ex: 14.6

Exercise 14.6

1. Draw $\angle POQ$ of measure 75° 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° and construct its bisector.

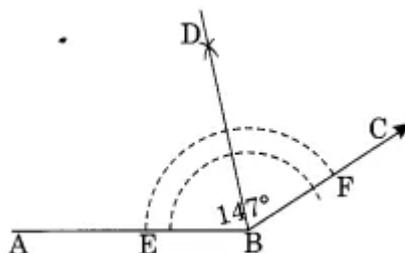
Ans. Step I: Draw $\angle ABC = 147^\circ$ with the help of a protractor.

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.

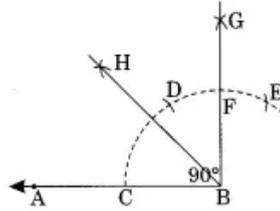
Thus, BD is the bisector of $\angle ABC$.



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.

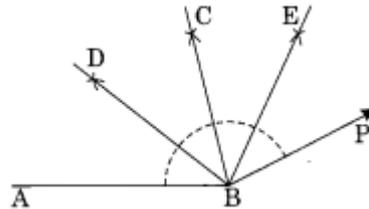
Step V: Join B and G such that $\angle ABG = 90^\circ$

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° 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.

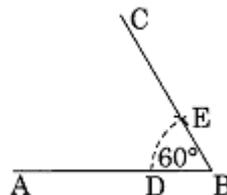
Step III: Draw BD and BE as the bisector of $\angle ABC$ and $\angle CBP$ respectively.

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° (b) 30° (c) 90° (d) 120°
 (e) 45° (f) 135°

Ans. (a) Angle of 60°

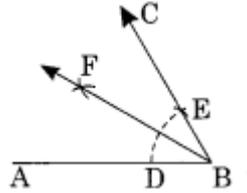


Step I: Draw a line segment \overline{AB} .

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° .

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

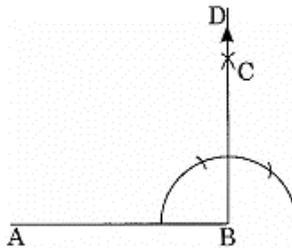


Thus $\angle ABF = \frac{60}{2} = 30^\circ$.

(c) Angle of 90°

In the given figure,

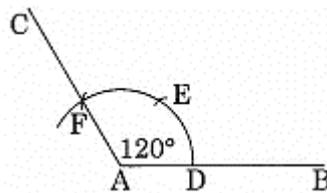
$\angle ABC = 90^\circ$ (Refer to solution 3)



(d) Angle of 120° .

Step I: Draw \overline{AB}

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

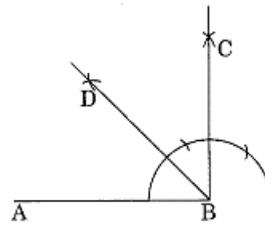


Step III: With center D and the same radius, draw two marks E and F on the former arc.

Step IV: Join A to F and produce to C. Thus $\angle CAB = 120^\circ$

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

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

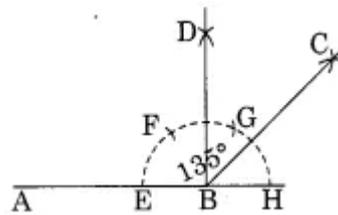


(f) An angle of 135°

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

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

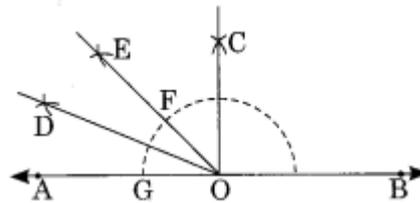
In this figure $\angle ABC = 135^\circ$



6. Draw an angle of measure 45° 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.

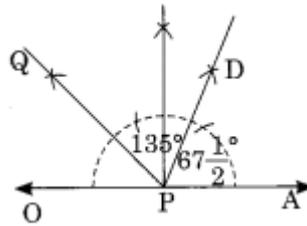
Step IV: With centers G and F and proper radius, draw two arcs that intersect each other at D.

Step V: Join O to D.

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

7. Draw an angle of measure 135° and bisect it.

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



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

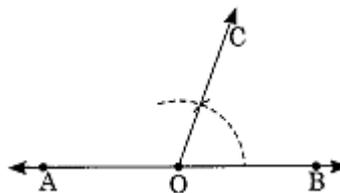
Step III: Draw PD as the bisector of angle APQ.

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

8. Draw an angle of 70° . Make a copy of it using only a straight edge and compasses.

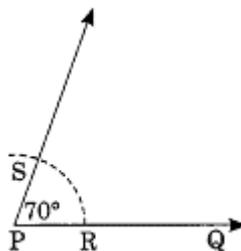
Ans. Step I: Draw a line AB and take any point O on it.

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.

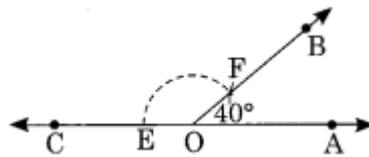
Step VI: With center R and keeping and radius equal to EF, draw an arc intersecting the former arc at S.

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° . Copy its supplementary angle.

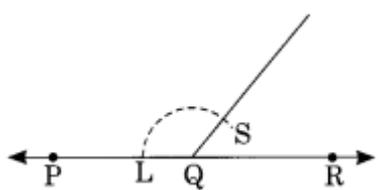
Ans. Step I: Construct $\angle AOB = 40^\circ$ using a protractor.

$\angle COF$ 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.,