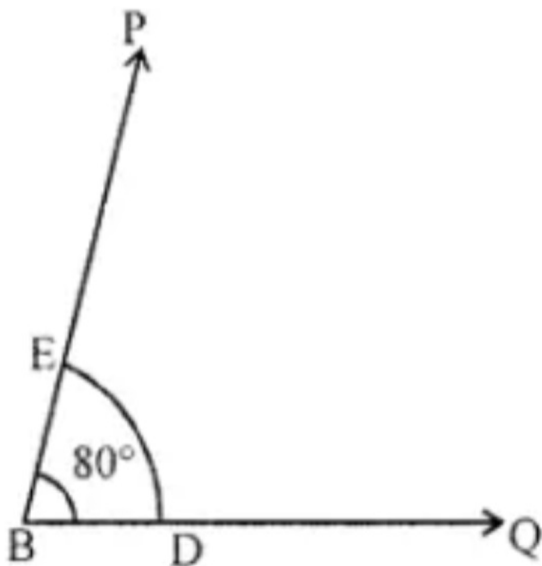Question 1.

Draw an angle of 80° and make a copy of it using ruler and compass.

Solution:

Steps of construction :

(i) Construct an angle ABC = 80°.

(ii) Take a line l and mark a point D on it.

(iii) Fix the compass pointer on B and draw an arc which cuts the sides of ∠ABC at D and E.

(iv) Without changing the compass setting, place the pointer on P and draw an arc which cuts l at Q.

(v) Open the compass equal to length DE.

(vi) Without disturbing the radius on compass, place its pointer at Q and draw an arc which cuts the previous arc at R.

(vii) Join PR and draw ray PR.

Its gives ∠RPQ which is the required angle whose measure is equal to the measure of ∠ABC.
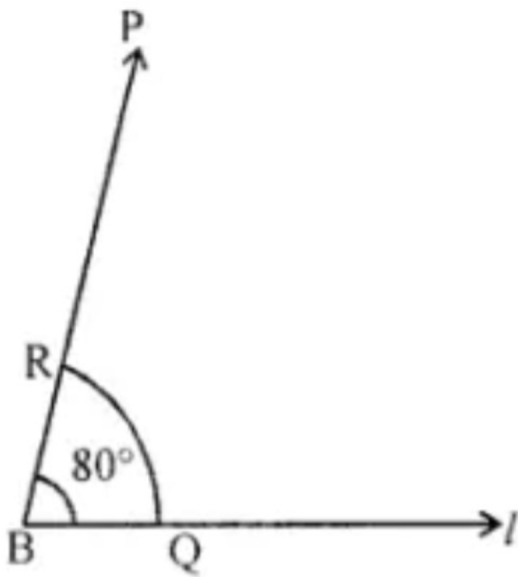
Question 2.

Draw an angle of measure 127° and construct its bisector.

Solution:

Steps of construction :

(i) Draw $\overline{OQ}$ of any length.

(ii) Place the centre of the protractor at O and the zero edge along $\overline{OQ}$.

(iii) Start with 0 near Q. Mark point P at 127°.

(iv) Join $\overline{OP}$. Then, ∠POQ = 127°

(v) With O as centre and using compass, draw an arc that cuts both rays of ∠POQ. Label the points of intersection as P' and Q'.

(vi) With Q' as centre, draw (in the interior of ∠POQ) an arc whose radius is more than half the length Q'P'.

(vii) With the same radius and with P' as centre, draw another arc in the interior of ∠POQ. Let the two arcs intersect at R. Then, $\overline{OR}$ is the bisector of ∠POQ.
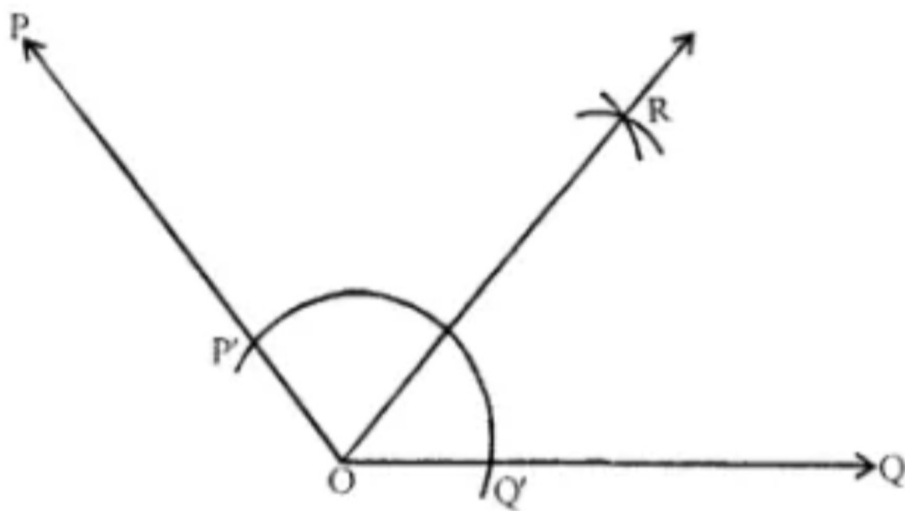
## Question 3.

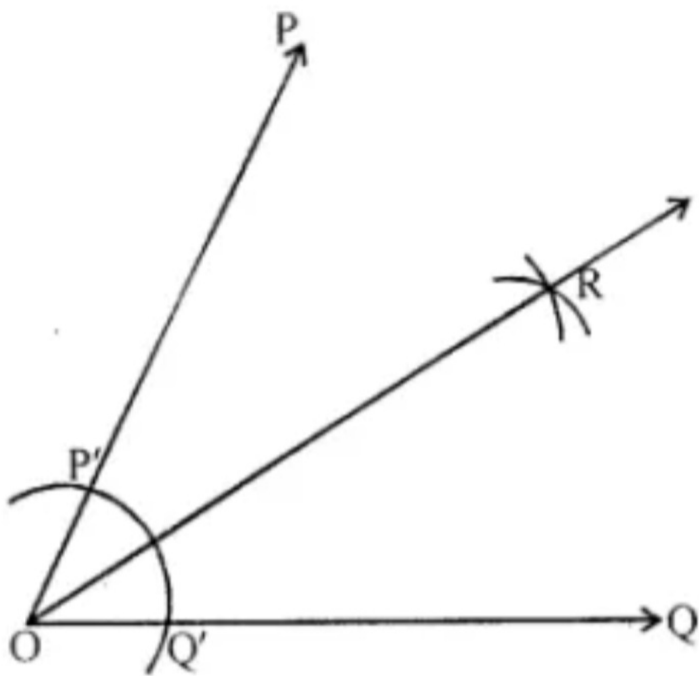Draw ∠POQ = 64°. Also draw its line of symmetry.

Solution:

Steps of construction :

(i) Draw a ray $\overline{OQ}$

(ii) Place the centre of the protractor at O and the zero edge along $\overline{OQ}$.

(iii) Start with 0 near Q. Mark point P at 64°.

(iv) Join $\overline{OP}$. Then, ∠POQ = 64°.

(v) With O as centre and using compass, draw an arc that cuts both rays of ∠POQ. Label the points of intersection as P' and Q'.

(vi) With Q' as centre, draw (in the interior of ∠POQ) an arc whose radius is more than half the length Q'P'.

(vii) With the same radius and with P' as centre, draw another arc in the interior of ∠POQ. Let the two arcs intersect at R.

Then, $\overline{OR}$ is the bisector of ∠POQ which is also the line of symmetry of ∠POQ as ∠POR = ∠ROQ.

## Question 4.

Draw a right angle and construct its bisector.

Solution:
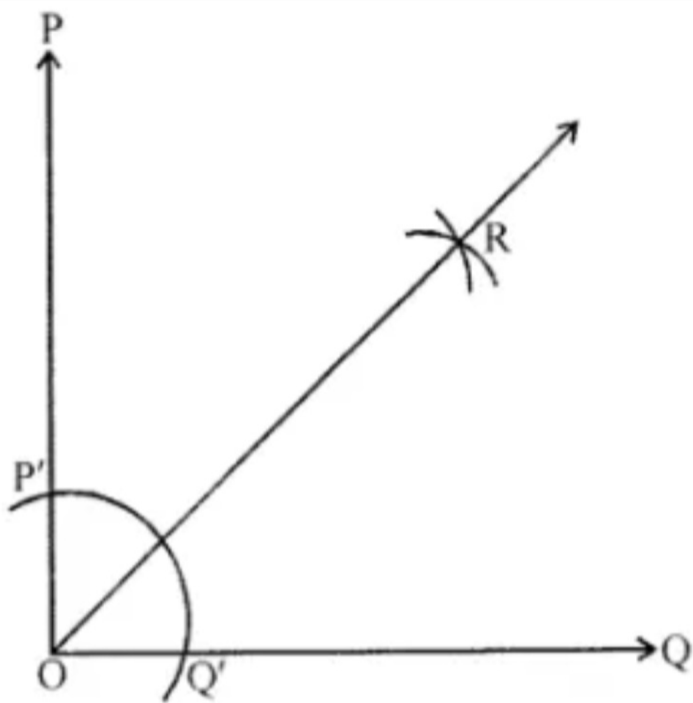
Steps of construction :

(i) Draw a ray OQ.

(ii) Place the centre of the protractor at O and the zero edge along $\overline{OQ}$.

(iii) Start with 0 near Q. Mark point P at 90°.

(iv) Join $\overline{OP}$. Then, $\angle POQ = 90°$

(v) With 0 as centre and using compass, draw an arc that cuts both rays of $\angle POQ$.

Label the points of intersection as P' and Q'.

(vi) With Q' as centre, draw (in the interior of $\angle POQ$) an arc whose radius is more than half the length Q'P'.

(vii) With the same radius and with P' as centre, draw another arc in the interior of $\angle POQ$.

Let the two arcs intersect at R.

Then, $\overline{OR}$ is the bisector of $\angle POQ$.

Question 5.

Draw an angle of 152° and divide it into four equal parts.

Solution:

Steps of construction :

(i) Draw a ray $\overline{OQ}$.

(ii) Place the centre of the protractor at O and the zero edge along $\overline{OQ}$.

(iii) Start with 0 near Q. Mark a point P at 152°.

(iv) Join OP. Then, ∠POQ =152°

(v) With O as centre and using compass, draw an arc that cuts both rays of ∠POQ. Label the points of intersection as P' and Q'.

(vi) With Q' as centre, draw (in the interior of ∠POQ) an arc whose radius is more than half the length Q'P'.

(vii) With the same radius and with P' as centre, draw another arc in the interior of ∠POQ. Let the two arcs intersect at R. Then, $\overline{OR}$ is the bisector of ∠POQ.

(viii)With O as centre and using compasses, draw an arc that cuts both rays of ∠ROQ. Label the points of intersection as B and A.

(ix) With A as centre, draw (in the interior of ∠ROQ) an arc whose radius is more than half the length AB.

(x) With the same radius and with B as centre, draw another arc in the interior of ∠ROQ.

Let the two arcs intersect at S. Then, $\overline{OS}$ is the bisector of ∠ROQ.

(xi) With O as centre and using compass, draw an arc that cuts both rays of ∠POR. Label the points of intersection as D and C.

(xii) With C as centre, draw (in the interior of ∠POR) an arc whose radius is more than half the length CD.

(xiii) With the same radius and with D as centre, draw another arc in the interior of ∠POR.

Let the two arcs intersect at T.

Then, $\overline{OT}$ is the bisector of ∠POR.

Thus, $\overline{OS}$, $\overline{OR}$ and $\overline{OT}$ divide ∠POQ = 152° into four equal parts.
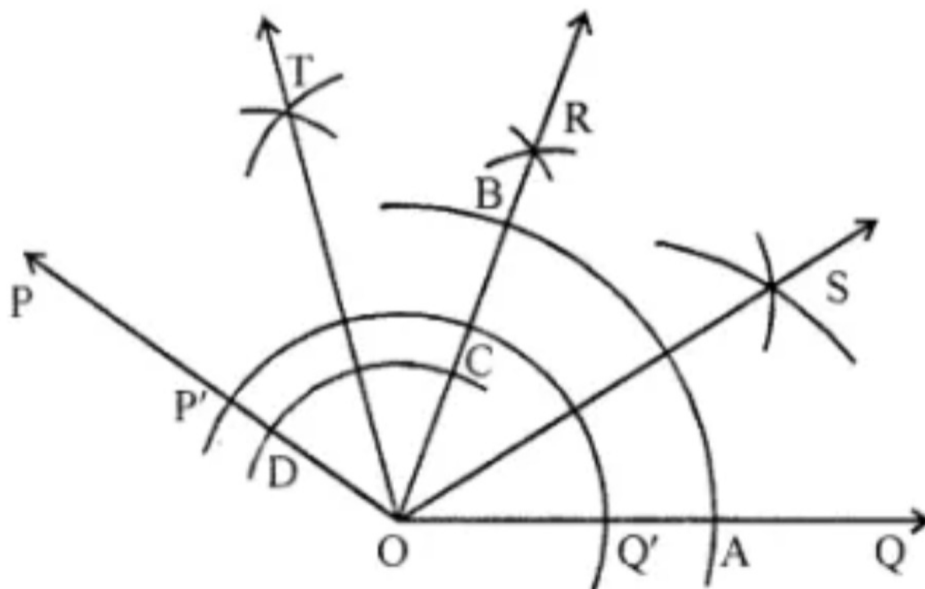
Question 6.

Draw an angle of measure 45° and bisect it.

Solution:

Steps of construction :

(i) Draw a straight line BC.

(ii) With B as a centre and any suitable radius,
draw an arc to meet BC at E.

(iii) With E as centre and same radius
draw an arc to meet the previous arc at G.

(iv) With G and F as centre and same radius
draw another arc to meet the first arc at H.

(v) With H and E as centre draw two arcs of equal
radius less than $\frac{1}{2}$ GE.

(vi) Cutting each other at J joined BJ and produce it
to D.

(vii) With L and E as centre draw two arcs of equal
radius less than $\frac{1}{2}$ LE.

(viii) Cutting each other at K joined BK and produce it
to I.

(ix) Measuring angle ∠IBC = 22.5°