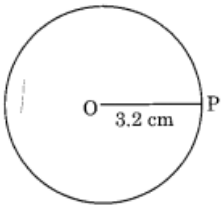
NCERT Solutions For Class 6 Maths Chapter 14 Practical Geometry Ex 14.1

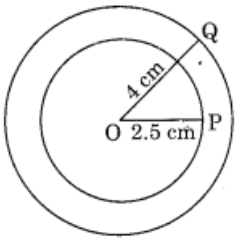
Exercise 14.1

Ex 14.1 Class 6 Maths Question 1.
Draw a circle of radius 3.2 cm.
Solution:
Step I : Mark a point O as a centre.
Step II: Open the compass up to the given radius 3.2 cm.



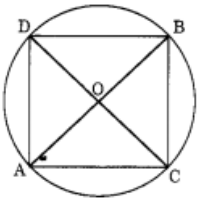
Step III : Put the needle of the compass at the centre O.
Step IV : Holding the top of the compass take one full round with pencil. The figure thus obtained is the required circle of radius 3.2 cm.

Ex 14.1 Class 6 Maths Question 2.
With the same centre O, Draw two circles of radius 4 cm and 2.5 cm.
Solution:
Step I : Take centre O and open the compass up to 4 cm.

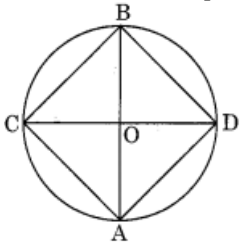


Step II : Draw a circle keeping the needle fixed at O.
Step III : Take the same centre O and open the compass up to 2.5 cm, and draw another circle.
The figure shows the required two circles with the same centre.

Ex 14.1 Class 6 Maths Question 3.
Draw a circle and any two its diameters. If you join the ends of these diameters, what is the figure obtained? What figure is obtained if the diameters are perpendicular to each other? How do you check your answer?
Solution:

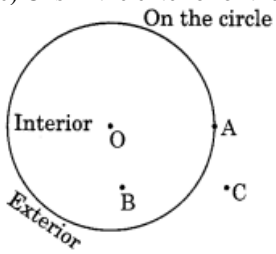


(i) Draw a circle with centre 0 with suitable radius.
(ii) AB and CD are any two diameters.
(iii) On joining the end points of the diameters, we get a quadrilateral ACBD.
(iv) We note that OA = OB = OC = OD [Same radius]
and AC = DB, AD = BC
$\angle A = \angle C = \angle B = \angle D = 90°$
Thus ACBD is a rectangle.
Again if the diameters are perpendicular to each other then on measuring, we get
AC = DB = AD = BC
Thus, ACBD is a square.



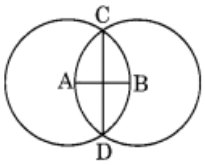
Ex 14.1 Class 6 Maths Question 4.
Draw any circle and mark points A, B and C such that
(a) A is on the circle
(b) B is in the interior of the circle

(c) C is in the exterior of the circle.
Solution:
Draw a circle with centre 0 and a suitable radius.
Here
(a) A is on the circle.
(b) B is in the interior of the circle.
(c) C is in the exterior of the circle.



Ex 14.1 Class 6 Maths Question 5.
Let A, B be the centres of the two circles of equal radii. Draw them so that each one of them passes through the centre of the other. Let them intersect at C and D.

Examine whether $\overline{AB}$ and $\overline{CD}$ are at right angles.
Solution:



In the given figure two circles of equal radii intersect each other at C and D on measuring, we see that $\overline{AB}$ and $\overline{CD}$ intersect each other at right angles.

Exercise 14.1

Question 1:

Draw a circle of radius 3.2 cm.

Answer:

The required circle can be drawn as follows.

Step 1

First, open the compasses for the required radius 3.2 cm.

Step 2

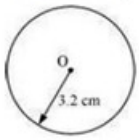
Mark a point 'O' where we want the centre of the circle to be.

Step 3

Place the pointer of compasses on O.

Step 4

Turn the compasses slowly to draw the circle.



Question 2:

With the same centre O, draw two circles of radii 4 cm and 2.5 cm.

Answer:

The required circle can be drawn as follows.

First, open the compasses for the required radius 4 cm.

Step 2

Mark a point 'O' where we want the centre of the circle to be.

Step 3

Place the pointer of compasses on O.

Step 4

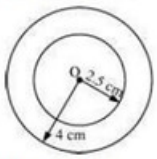
Turn the compasses slowly to draw the circle.

Step 5

Now, open the compasses for 2.5 cm.

Step 6

Again put the pointer of the compasses on point 'O' and turn the compasses slowly to draw the circle.

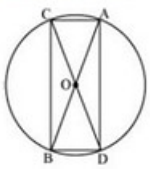


Question 3:

Draw a circle and any two of its diameters. If you join the ends of these diameters, what is the figure obtained? What figure is obtained if the diameters are perpendicular to each other? How do you check your answer?

Answer:

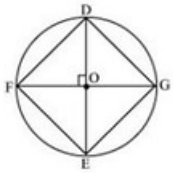
A circle can be drawn of any convenient radius, also having its centre as O. Let AB and CD be two diameters of this circle. When we join the ends of these diameters, a quadrilateral ACBD is formed.



As we know that the diameters of a circle are equal in length, therefore, the quadrilateral so formed will have its diagonals of equal length.

Also, OA = OB = OC = OD = radius *r* and if a quadrilateral has its diagonals of same length which are bisecting each other, then it will be a rectangle.

Let DE and FG be two diameters of this circle such that these are perpendicular to each other. A quadrilateral is formed by joining the ends of these diameters.



Here, OD = OE = OF = OG = radius *r*

In this quadrilateral DFEG, the diagonals are equal and perpendicular to each other. Also, since these are bisecting each other, it will be a square.

The length of the sides of the quadrilateral so formed can be measured to check our answers.

Question 4:

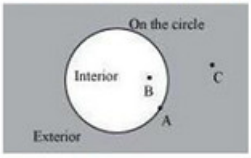
Draw any circle and mark points A, B and C such that

(a) A is on the circle. (b) B is in the interior of the circle.

(c) C is in the exterior of the circle.

Answer:

A circle and three required points A, B, C can be drawn as follows.



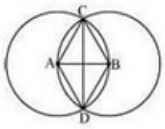
Question 5:

Let A, B be the centres of two circles of equal radii; draw them so that each one of them passes through the centre of the other. Let them intersect at C and D.

Examine whether $\overline{AB}$ and $\overline{CD}$ are at right angles.

Answer:

Let us draw two circles of same radius which are passing through the centres of the other circle.



Here, point A and B are the centres of these circles and these circles are intersecting each other at point C and D.

In quadrilateral ADBC,

AD = AC (Radius of circle centered at A)

BC = BD (Radius of circle centered at B)

As radius of both circles are equal, therefore, AD = AC = BC = BD

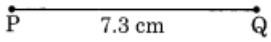
Hence, $\square ADBC$ is a rhombus and in a rhombus, the diagonals bisect each other at 90°.

Hence, $\overline{AB}$ and $\overline{CD}$ are at right angles.

NCERT Solutions For Class 6 Maths Chapter 14 Practical Geometry Ex 14.2

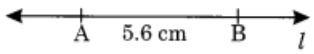
Exercise 14.2

Ex 14.2 Class 6 Maths Question 1.
Draw a line segment of length 7.3 cm using ruler.
Solution:
Step I: Mark at point P.
Step II : Place the O mark of the ruler against the point P.
Step III : Mark a point Q at a distance of 7.3 cm from P.
Step IV : Join P and Q.



Thus $\overline{PQ}$ is the line segment of length 7.3 cm.

Ex 14.2 Class 6 Maths Question 2.
Construct a line segment of length 5.6 cm using ruler and compass.
Solution:
Step I: Draw any line L of suitable lengths.
Step II : Place the needle of the compass on the zero mark of the ruler and open it upto 5.6 mark.
Step III : Place the needle at any point A at the line and draw an arc to cut l at B.



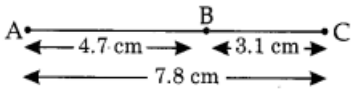
Thus, $\overline{AB}$ is the required line segment of length 5.6 cm.

Ex 14.2 Class 6 Maths Question 3.

Construct $\overline{AB}$ of length 7.8 cm. From this, cut off $\overline{AC}$ of length 4.7 cm. Measure $\overline{BC}$.
Solution:

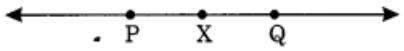
Given that $\overline{AB}$ = 7.8 cm and $\overline{AC}$ = 4.7 cm.
Step I : Place zero mark of the ruler at A.
Step II : Mark a point B at a distance of 7.8 cm from A.
Step III : Mark another point C at a distance of 4.7 cm from A such that AC = 4.7 cm.

Step IV : On measuring the length of BC, we find that $\overline{BC}$ = 3.1 cm.



Ex 14.2 Class 6 Maths Question 4.

Given $\overline{AB}$ of length 3.9 cm. Construct $\overline{PQ}$ such that the length of $\overline{PQ}$ is twice that of $\overline{AB}$. Verify by measurement.



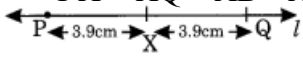
(Hint : Construct $\overline{PX}$ such that the length of $\overline{PX}$ = length of $\overline{AB}$ then cut off $\overline{XQ}$ such that $\overline{XQ}$ also has the length of $\overline{AB}$.
Solution:
Step I: Draw a line l of suitable length.

Step II: Draw $\overline{AB}$ = 3.9 cm

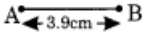
Step III: From the line, construct $\overline{PX}$ = $\overline{AB}$ = 3.9 cm.

Step IV: Again construct $\overline{XQ}$ = $\overline{AB}$ =3.9 cm

Verification: $\overline{PX}$ + $\overline{XQ}$ = $\overline{AB}$ + $\overline{AB}$



$\therefore$ $\overline{PQ}$ = 3.9 + 3.9 = 7.8 cm

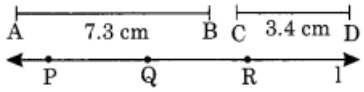


Thus twice of $\overline{AB}$ is equal to $\overline{PQ}$

Ex 14.2 Class 6 Maths Question 5.

Given $\overline{AB}$ of length 7.3 cm and $\overline{CD}$ of length 3.4 cm, construct a line segment $\overline{XY}$ such that the length of XY is equal to the difference between the length of $\overline{AB}$ and $\overline{CD}$. Verify the measurement.
Solution:

Step I : Construct $\overline{AB}$ = 7.3 cm and $\overline{CD}$ = 3.4 cm.



Step II: Take a point P on the given line l.

Step III: Construct $\overline{PR}$ such that $\overline{PR}$ = $\overline{AB}$ = $\overline{AB}$ = 7.3 cm.

Step IV:Construct $\overline{RQ}$ = $\overline{CD}$ = 3.4 cm such that PQ = $\overline{AB}$ – $\overline{CD}$.

Verification : On measuring, we observe that $\overline{PQ}$ = 3.9 cm = 7.3 cm 3.4 cm.

= $\overline{AB}$ – $\overline{CD}$

Thus, $\overline{PQ}$ = $\overline{AB}$ – $\overline{CD}$.

Exercise 14.2

Question 1:

Draw a line segment of length 7.3 cm using a ruler.

Answer:

A line segment of length 7.3 cm can be drawn using a ruler as follows.

(1) Mark a point A on the sheet.

(2) Put 0 mark of ruler at point A.

(3) Mark a point B on the sheet at 7.3 cm on ruler.

(4) Join A and B.

$\overline{AB}$ is the required line segment.

Question 2:

Construct a line segment of length 5.6 cm using ruler and compasses.

Answer:

A line segment of length 5.6 cm can be drawn using a ruler and compasses as follows.

(1) Draw a line *l* and mark a point A on this line.

(2) Place the compasses on the zero mark of the ruler. Open it to place the pencil up to the 5.6 cm mark.

(3) Place the pointer of compasses on point A and draw an arc to cut *l* at B. AB is the line segment of 5.6 cm length.

Question 3:

Construct $\overline{AB}$ of length 7.8 cm. From this, cut off $\overline{AC}$ of length 4.7 cm. Measure $\overline{BC}$.

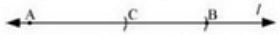
Answer:

(1) Draw a line *l* and mark a point A on it.

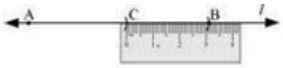
(2) By adjusting the compasses up to 7.8 cm, draw an arc to cut *l* on B, while putting the pointer of compasses on point A.

$\overline{AB}$ is the line segment of 7.8 cm.

(3) By adjusting the compasses up to 4.7 cm, draw an arc to cut *l* on C, while putting the pointer of compasses on point A. $\overline{AC}$ is the line segment of 4.7 cm.



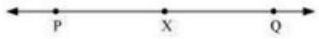
(4) Now, put the ruler along with this line such that 0 mark of the ruler will match with point C.



On reading the position of point B, it comes to 3.1 cm. $\overline{BC}$ is 3.1 cm.

Question 4:

Given $\overline{AB}$ of length 3.9 cm, construct $\overline{PQ}$ such that the length of $\overline{PQ}$ is twice that of $\overline{AB}$. Verify by measurement.

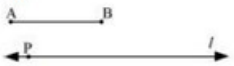


(Hint: construct $\overline{PX}$ such that length of $\overline{PX}$ = length of $\overline{AB}$; then cut off $\overline{XQ}$ such that $\overline{XQ}$ also has the length of $\overline{AB}$.)

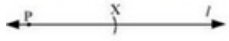
Answer:

A line segment $\overline{PQ}$ can be drawn such that the length of $\overline{PQ}$ is twice that of $\overline{AB}$ as follows.

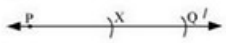
(1) Draw a line *l* and mark a point P on it and let AB be the given line segment of 3.9 cm.



(2) By adjusting the compasses up to the length of AB, draw an arc to cut the line at X, while taking the pointer of compasses at point P.



(3) Again put the pointer on point X and draw an arc to cut line *l* again at Q.



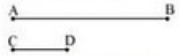
$\overline{PQ}$ is the required line segment. By ruler, the length of $\overline{PQ}$ can be measured which comes to 7.8 cm.

Question 5:

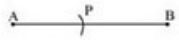
Given $\overline{AB}$ of length 7.3 cm and $\overline{CD}$ of length 3.4 cm, construct a line segment $\overline{XY}$ such that the length of $\overline{XY}$ is equal to the difference between the lengths of $\overline{AB}$ and $\overline{CD}$. Verify by measurement.

Answer:

(1) Given that, $\overline{AB}$ =7.3 cm and $\overline{CD}$ = 3.4 cm



(2) Adjust the compasses up to the length of CD and put the pointer of the compasses at A. Draw an arc to cut AB at P.



(3) Adjust the compasses up to the length of PB. Now draw a line *l* and mark a point X on it.

(4) Now, putting the pointer of compasses at point X, draw an arc to cut the line at Y.

NCERT Solutions For Class 6 Maths Chapter 14 Practical Geometry Ex 14.3

Exercise 14.3

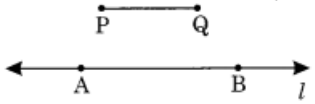
Ex 14.3 Class 6 Maths Question 1.

Draw any line segment $\overline{PQ}$. Without measuring $\overline{PQ}$, construct a copy of $\overline{PQ}$.

Solution:

Step I: Draw $\overline{PQ}$ of unknown length.
Step II : Draw a line l and mark a point A on it.
Step III: Open the compass equal to PQ.
Step IV : Place the needle of the compass at A and mark a point B on l.

Thus, $\overline{AB}$ is a copy of $\overline{PQ}$.



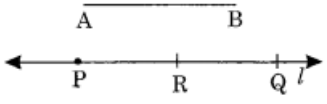
Ex 14.3 Class 6 Maths Question 2.

Given some line segment $\overline{AB}$ whose length you do not know, construct $\overline{PQ}$ such that the length of $\overline{PQ}$ is twice that of $\overline{AB}$.

Solution:

Step I : Draw $\overline{AB}$ of any suitable length.
Step II : Place the needle of the compass at A and the other pencil end at B.
Step III : Draw a line l and take a point P on it.
Step IV: With the same opening of the compass, place the needle at P and mark another point Q on l.

Thus $\overline{PQ}$ is the required line segment whose length is twice the length of $\overline{AB}$ i.e $\overline{PQ} = \overline{2AB}$.



Exercise 14.3

Question 1:

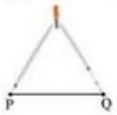
Draw any line segment $\overline{PQ}$. Without measuring $\overline{PQ}$, construct a copy of $\overline{PQ}$.

Answer:

The following steps will be followed to draw the given line segment $\overline{PQ}$ and to construct a copy of $\overline{PQ}$.

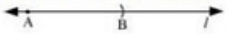
(1) Let $\overline{PQ}$ be the given line segment.

(2) Adjust the compasses up to the length of $\overline{PQ}$.



(3) Draw any line *l* and mark a point A on it.

(4) Put the pointer on point A, and without changing the setting of compasses, draw an arc to cut the line segment at point B.



$\overline{AB}$ is the required line segment.

Question 2:

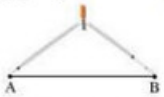
Given some line segment $\overline{AB}$, whose length you do not know, construct $\overline{PQ}$ such that the length of $\overline{PQ}$ is twice that of $\overline{AB}$.

Answer:

The following steps will be followed to construct a line segment $\overline{PQ}$ such that the length of $\overline{PQ}$ is twice that of $\overline{AB}$.

(1) Let $\overline{AB}$ be the given line segment.

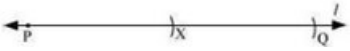
(2) Adjust the compasses up to the length of $\overline{AB}$.



(3) Draw any line *l* and mark a point P on it.

(4) Put the pointer on P and without changing the setting of compasses, draw an arc to cut the line segment at point X.

(5) Now, put the pointer on point X and again draw an arc with the same radius as before, to cut the line *l* at point Q.



NCERT Solutions For Class 6 Maths Chapter 14 Practical Geometry Ex 14.4

Exercise 14.4

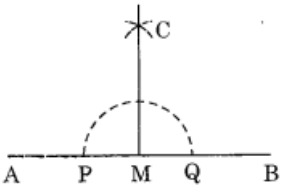
Ex 14.4 Class 6 Maths Question 1.

Draw any line segment $\overline{AB}$. Make any point M on it. Through M, draw a perpendicular to $\overline{AB}$. (Use ruler and Compasses)

Solution:

Step I : Draw a line segment $\overline{AB}$ and mark any point M on it.

Step II : Put the pointer of the compass at M and draw an arc of suitable radius such that it intersects $\overline{AB}$ at P and Q.



Step III : Take P and Q as centres and radius greater than PM, draw two arcs such that they intersect each other at C.

Step IV : Join M and C.

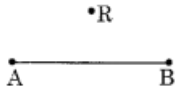
Thus CM is the perpendicular to $\overline{AB}$.

Ex 14.4 Class 6 Maths Question 2.

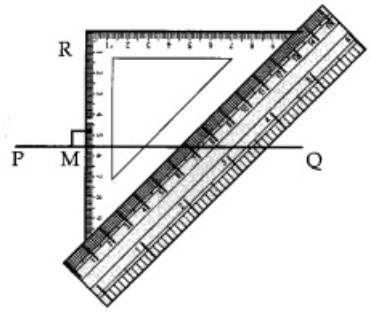
Draw any line segment $\overline{PQ}$. Take any point R not on it. Through R, draw a perpendicular to $\overline{PQ}$. (Use ruler and set square).
Solution:

Step I: Draw a line segment $\overline{PQ}$ and a point R outside of $\overline{PQ}$.

Step II : Place a set square on $\overline{PQ}$ such that one side of its right angle be along it.
Step III: Place a ruler along the longer side of the set square.



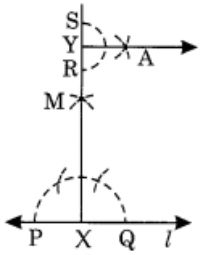
Step IV : Hold the ruler fix and slide the set square along the ruler till it touches the point R.



Step V : Join RM along the edge through R. Thus $\overline{RM} \perp \overline{PQ}$.

Ex 14.4 Class 6 Maths Question 3.

Draw a line l and a point X on it. Through X, draw a line segment $\overline{XY}$ perpendicular to l. Now draw a perpendicular to $\overline{XY}$ at y. (Use ruler and compasses)
Solution:
Step I: Draw a line l and take a point X on it.
Step II : Draw an arc with centre X and of suitable radius to intersect the line l at two points P and Q.



Step III : With P and Q as centres and a radius greater than P draw two arcs to intersect each other at M.
Step IV : Join XM and produce to Y.
Step V : With Y as centre and a suitable radius, draw an arc to intersect XY at two points R and S.
Step VI: With R and S as centres and a radius greater than YR, draw two arcs to intersect each other at A.
Step VII: Join Y and A. Thus YA ⊥ XY.

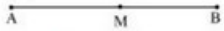
Exercise 14.4

Question 1:

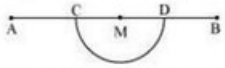
Draw any line segment $\overline{AB}$. Mark any point M on it. Through M, draw a perpendicular to $\overline{AB}$. (Use ruler and compasses)

Answer:

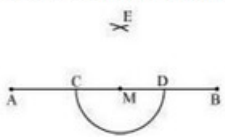
(1) Draw the given line segment $\overline{AB}$ and mark any point M on it.

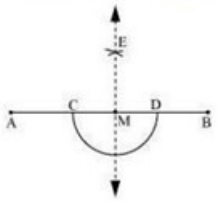


(2) With M as centre and a convenient radius, construct an arc intersecting the line segment $\overline{AB}$ at two points C and D.



(3) With C and D as centres and a radius greater than CM, construct two arcs. Let these be intersecting each other at E.



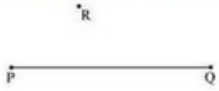


Question 2:

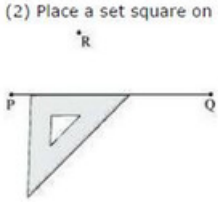
Draw any line segment $\overline{PQ}$. Take any point R not on it. Through R, draw a perpendicular to $\overline{PQ}$. (Use ruler and set-square)

Answer:

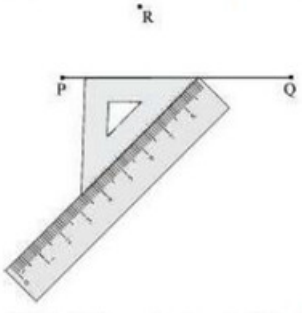
(1) Take the given line segment $\overline{PQ}$ and mark any point R outside $\overline{PQ}$.



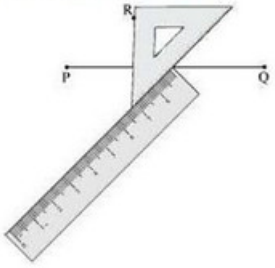
(2) Place a set square on $\overline{PQ}$ such that one arm of its right angle aligns along $\overline{PQ}$.



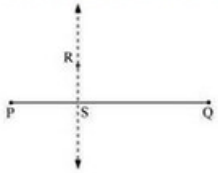
(3) Place the ruler along the edge opposite to the right angle of the set square.



(4) Hold the ruler fixed. Slide the set square along the ruler till the point R touches the other arm of the set square.



(5) Draw a line along this edge of the set square which will be passing through R. It is the required line, which is perpendicular to $\overline{PQ}$.



Question 3:

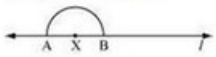
Draw a line *l* and point X on it. Through X, draw a line segment $\overline{XY}$ perpendicular to *l*.

Now draw a perpendicular to $\overline{XY}$ at Y. (use ruler and compasses)

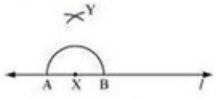
Answer:

(1) Draw a line *l* and mark a point X on it.

(2) Taking X as centre and with a convenient radius, draw an arc intersecting line *l* at two points A and B.



(3) With A and B as centres and a radius more than AX, construct two arcs intersecting each other at Y.



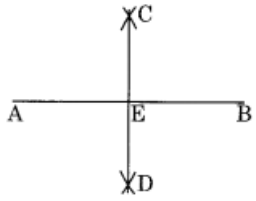
(4) Join XY. $\overline{XY}$ is perpendicular to *l*.

NCERT Solutions For Class 6 Maths Chapter 14 Practical Geometry Ex 14.5

Exercise 14.5

Ex 14.5 Class 6 Maths Question 1.
Draw AB of length 7.3 cm and find its axis of symmetry.
Solution:

Step I: Draw $\overline{AB}$ = 7.3 cm

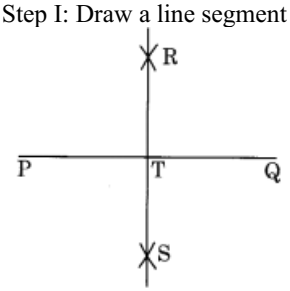


Step II: Taking A and B as centre and radius more than half of $\overline{AB}$, draw two arcs which intersect each other at C and D.

Step III: Join C and D to intersect $\overline{AB}$ at E. Thus, CD is the perpendicular bisector or axis of symmetry of $\overline{AB}$.

Ex 14.5 Class 6 Maths Question 2.
Draw a line segment of length 9.5 cm and construct its perpendicular bisector.
Solution:

Step I: Draw a line segment $\overline{PQ}$ =9.5 cm



Step II: With centres P and Q and radius more than half of PQ, draw two arcs which meet each other at R and S.

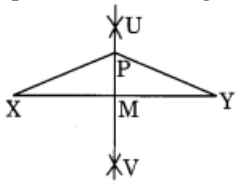
Step III: Join R and S to meet $\overline{PQ}$ at T.
Thus, RS is the perpendicular bisector of PQ.

Ex 14.5 Class 6 Maths Question 3.

Draw the perpendicular bisector of $\overline{XY}$ whose length is 10.3 cm.
(a) Take any point P on the bisector drawn. Examine whether PX = PY.

(b) If M is the midpoint of $\overline{XY}$. What can you say about the length of MX and MY?
Solution:

Step I: Draw a line segment $\overline{XY}$ = 10.3 cm.



Step II : With centre X and Y and radius more than half of XY, draw two arcs which meet each other at U and V.

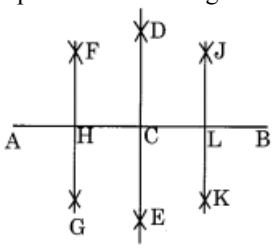
Step III: Join U and V which meets $\overline{XY}$ at M.

Step IV: Take a point P on $\overline{UV}$.
(a) On measuring, PX = PY = 5.6 cm.

(b) On measuring, $\overline{MX}$ = $\overline{MY}$ = $\frac{1}{2}$ XY = 5.15 cm.

Ex 14.5 Class 6 Maths Question 4.
Draw a line segment of length 12.8 cm. Using compasses, divide it into four equal parts. Verify by actual measurement.
Solution:

Step I: Draw a line segment $\overline{AB}$ = 12.8 cm



Step II : With centre A and B and radius more than half of AB, draw two arcs which meet each other at D and E.

Step III : Join D and E which meets $\overline{AB}$ at C which is the midpoint of $\overline{AB}$.
Step IV : With centre A and C and radius more than half of AC, draw two arcs which meet each other at F and G.

Step V: Join F and G which meets $\overline{AC}$ at H which is the midpoint of $\overline{AC}$.
Step VI : With centre C and B and radius more than half of CB, draw two arcs which meet each other at J and K.

Step VII : Join J and K which meets $\overline{CB}$ at L which is the midpoint of $\overline{CB}$.
Thus, on measuring, we find

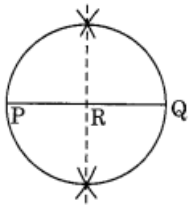
$\overline{AH}$ = $\overline{HC}$ = $\overline{CL}$ = $\overline{LB}$ = 3.2 cm.

Ex 14.5 Class 6 Maths Question 5.

With $\overline{PQ}$ of length 6.1 cm as diameter, draw a circle.
Solution:

Step I: Draw $\overline{PQ}$ = 6.1 cm

Step II: Draw a perpendicular bisector of $\overline{PQ}$ which meets $\overline{PQ}$ at R i.e. R is the midpoint of $\overline{PQ}$.



Step III : With centre R and radius equal to $\overline{RP}$, draw a circle passing through P and Q.

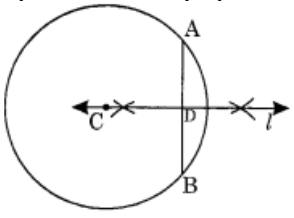
Thus, the circle with diameter $\overline{PQ}$ = 6.1 cm is the required circle.

Ex 14.5 Class 6 Maths Question 6.

Draw a circle with centre C and radius 3.4 cm. Draw any chord $\overline{AB}$. Construct the perpendicular bisector of $\overline{AB}$ and examine if it passes through C.
Solution:
Step I: Draw a circle with centre C and radius 3.4 cm.

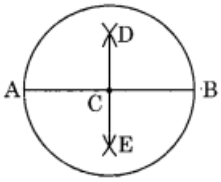
Step II: Draw any chord $\overline{AB}$.

Step III : Draw the perpendicular bisector of $\overline{AB}$ which passes through the centre C.



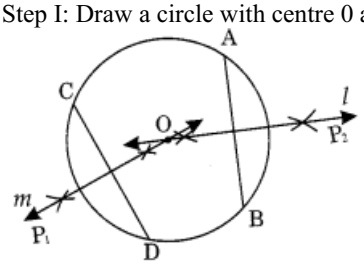
Ex 14.5 Class 6 Maths Question 7.

Repeat Question number 6, if $\overline{AB}$ happens to be a diameter.
Solution:
Step I: Draw a circle with centre C and radius 3.4 cm.
Step II : Draw a diameter AB of the circle.



Step III : Draw a perpendicular bisector of AB which passes through the centre C and on measuring, we find that C is the midpoint of $\overline{AB}$.

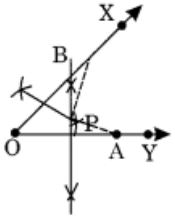
Ex 14.5 Class 6 Maths Question 8.
Draw a circle of radius 4 cm. Draw any two of its chords. Construct the perpendicular bisectors of these chords. Where do they meet?
Solution:
Step I: Draw a circle with centre 0 and radius 4 cm.



Step II: Draw any two chords $\overline{AB}$ and $\overline{CD}$ of the circle.

Step III : Draw the perpendicular bisectors of $\overline{AB}$ and $\overline{CD}$ i.e. I and m.
Step IV : On producing the two perpendicular bisectors meet each other at the centre O of the circle.

Ex 14.5 Class 6 Maths Question 9.
Draw any angle with vertex O. Take a point A on one of its arms and B on another such that OA = OB. Draw the perpendicular bisectors of $\overline{OA}$ and $\overline{OB}$. Let them meet at P. Is PA = PB?
Solution:
Step I: Draw an angle XOY with O as its vertex.
Step II : Take any point A on OY and B on OX, such that OA + OB.



Step III : Draw the perpendicular bisectors of OA and OB which meet each other at a point P.
Step IV : Measure the lengths of $\overline{PA}$ and $\overline{PB}$. Yes, $\overline{PA}$ = $\overline{PB}$.

Exercise 14.3

Question 1:

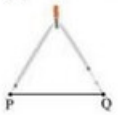
Draw any line segment $\overline{PQ}$. Without measuring $\overline{PQ}$, construct a copy of $\overline{PQ}$.

Answer:

The following steps will be followed to draw the given line segment $\overline{PQ}$ and to construct a copy of $\overline{PQ}$.

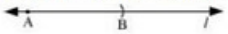
(1) Let $\overline{PQ}$ be the given line segment.

(2) Adjust the compasses up to the length of $\overline{PQ}$.



(3) Draw any line *l* and mark a point A on it.

(4) Put the pointer on point A, and without changing the setting of compasses, draw an arc to cut the line segment at point B.



$\overline{AB}$ is the required line segment.

Question 2:

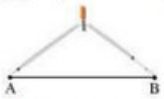
Given some line segment $\overline{AB}$, whose length you do not know, construct $\overline{PQ}$ such that the length of $\overline{PQ}$ is twice that of $\overline{AB}$.

Answer:

The following steps will be followed to construct a line segment $\overline{PQ}$ such that the length of $\overline{PQ}$ is twice that of $\overline{AB}$.

(1) Let $\overline{AB}$ be the given line segment.

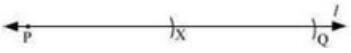
(2) Adjust the compasses up to the length of $\overline{AB}$.



(3) Draw any line *l* and mark a point P on it.

(4) Put the pointer on P and without changing the setting of compasses, draw an arc to cut the line segment at point X.

(5) Now, put the pointer on point X and again draw an arc with the same radius as before, to cut the line *l* at point Q.



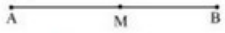
Exercise 14.4

Question 1:

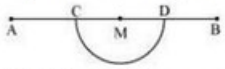
Draw any line segment $\overline{AB}$. Mark any point M on it. Through M, draw a perpendicular to $\overline{AB}$. (Use ruler and compasses)

Answer:

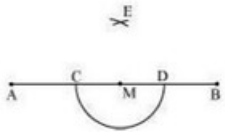
(1) Draw the given line segment $\overline{AB}$ and mark any point M on it.

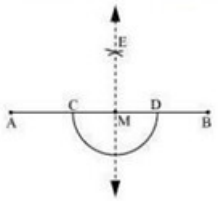


(2) With M as centre and a convenient radius, construct an arc intersecting the line segment $\overline{AB}$ at two points C and D.



(3) With C and D as centres and a radius greater than CM, construct two arcs. Let these be intersecting each other at E.



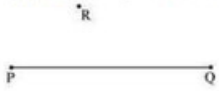


Question 2:

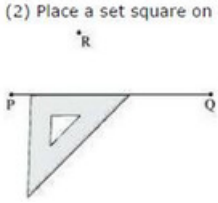
Draw any line segment $\overline{PQ}$. Take any point R not on it. Through R, draw a perpendicular to $\overline{PQ}$. (Use ruler and set-square)

Answer:

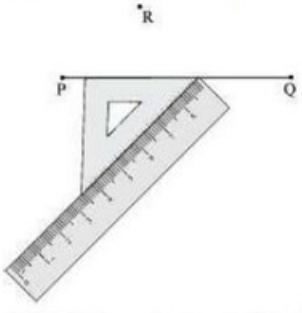
(1) Take the given line segment $\overline{PQ}$ and mark any point R outside $\overline{PQ}$.



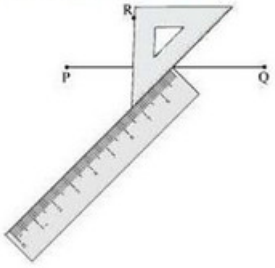
(2) Place a set square on $\overline{PQ}$ such that one arm of its right angle aligns along $\overline{PQ}$.



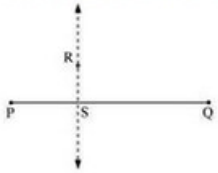
(3) Place the ruler along the edge opposite to the right angle of the set square.



(4) Hold the ruler fixed. Slide the set square along the ruler till the point R touches the other arm of the set square.



(5) Draw a line along this edge of the set square which will be passing through R. It is the required line, which is perpendicular to $\overline{PQ}$.



Question 3:

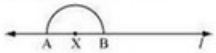
Draw a line *l* and point X on it. Through X, draw a line segment $\overline{XY}$ perpendicular to *l*.

Now draw a perpendicular to $\overline{XY}$ at Y. (use ruler and compasses)

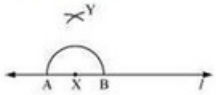
Answer:

(1) Draw a line *l* and mark a point X on it.

(2) Taking X as centre and with a convenient radius, draw an arc intersecting line *l* at two points A and B.



(3) With A and B as centres and a radius more than AX, construct two arcs intersecting each other at Y.



(4) Join XY. $\overline{XY}$ is perpendicular to *l*.

Exercise 14.5

Question 1:

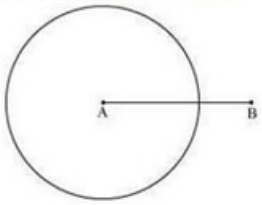
Draw $\overline{AB}$ of length 7.3 cm and find its axis of symmetry.

Answer:

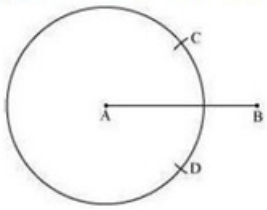
The below given steps will be followed to construct $\overline{AB}$ of length 7.3 cm and to find its axis of symmetry.

(1) Draw a line segment $\overline{AB}$ of 7.3 cm.

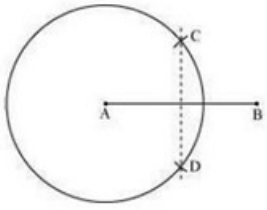
(2) Taking A as centre, draw a circle by using compasses. The radius of circle should be more than half the length of $\overline{AB}$.



(3) With the same radius as before, draw another circle using compasses while taking point B as centre. Let it cut the previous circle at C and D.



(4) Join $\overline{CD}$. $\overline{CD}$ is the axis of symmetry.



Question 2:

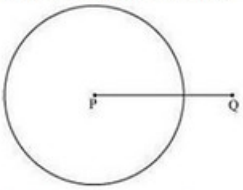
Draw a line segment of length 9.5 cm and construct its perpendicular bisector.

Answer:

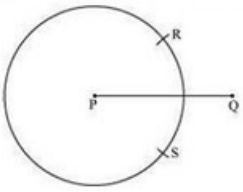
The below given steps will be followed to construct a line segment of length 9.5 cm and its perpendicular bisector.

(1) Draw a line segment $\overline{PQ}$ of 9.5 cm.

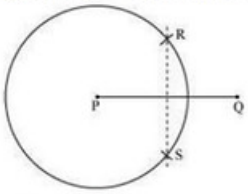
(2) Taking P as centre, draw a circle by using compasses. The radius of circle should be more than half the length of $\overline{PQ}$.



(3) With the same radius as before, draw another circle using compasses while taking point Q as centre. Let it cut the previous circle at R and S.



(4) Join RS. $\overline{RS}$ is the axis of symmetry i.e., the perpendicular bisector of line $\overline{PQ}$.



Question 3:

Draw the perpendicular bisector of $\overline{XY}$ whose length is 10.3 cm.

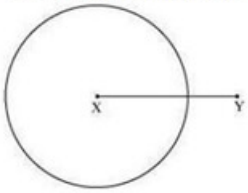
(a) Take any point P on the bisector drawn. Examine whether PX = PY.

(b) If M is the mid point of $\overline{XY}$, what can you say about the lengths MX and XY?

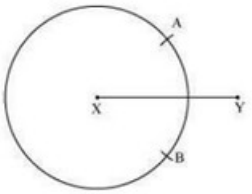
Answer:

(1) Draw a line segment $\overline{XY}$ of 10.3 cm.

(2) Taking point X as centre, draw a circle by using compasses. The radius of circle should be more than half the length of $\overline{XY}$.



(3) With the same radius as before, draw another circle using compasses while taking point Y as centre. Let it cut the previous circle at A and B.



(4) Join $\overline{AB}$. $\overline{AB}$ is the axis of symmetry.

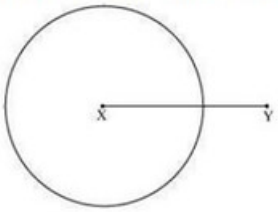
Question 4:

Draw a line segment of length 12.8 cm. Using compasses; divide it into four equal parts. Verify by actual measurement.

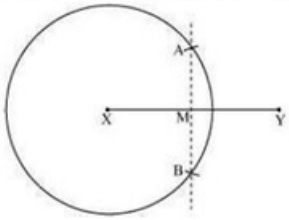
Answer:

(1) Draw a line segment $\overline{XY}$ of 12.8 cm.

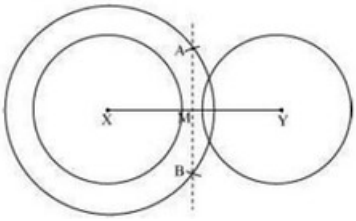
(2) Draw a circle, while taking point X as centre and radius more than half of XY.



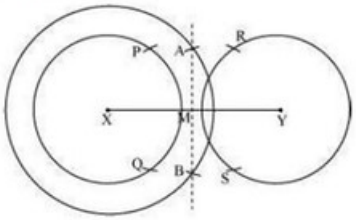
(3) With same radius and taking centre as Y, again draw arcs to cut the circle at A and B. Join AB which intersects $\overline{XY}$ at M.



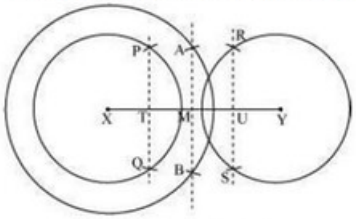
(4) Taking X and Y as centres, draw two circles with radius more than half of $\overline{XM}$.



(5) With same radius and taking M as centre, draw arcs to intersect these circles at P, Q and R, S.



(6) Join PQ and RS. These are intersecting $\overline{XY}$ at T and U.



(7) Now, $\overline{XT} = \overline{TM} = \overline{MU} = \overline{UY}$. These are 4 equal parts of $\overline{XY}$.

By measuring these line segments with the help of ruler, we will find that each is of 3.2 cm.

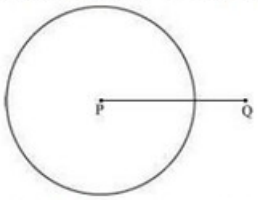
Question 5:

With $\overline{PQ}$ of length 6.1 cm as diameter draw a circle.

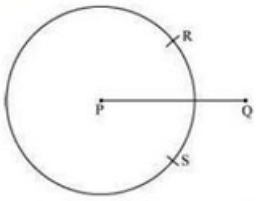
Answer:

(1) Draw a line segment $\overline{PQ}$ of 6.1 cm.

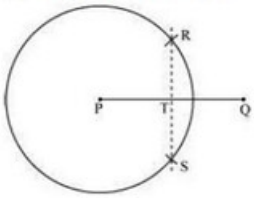
(2) Taking point P as centre and radius more than half of $\overline{PQ}$, draw a circle.



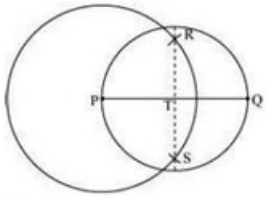
(3) With same radius and taking Q as centre, draw arcs to intersect this circle at points R and S.



(4) Join RS which intersects $\overline{PQ}$ at T.



(5) Taking T as centre and with radius TP, draw a circle which will also pass through Q. It is the required circle.



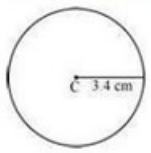
Question 6:

Draw a circle with centre C and radius 3.4 cm. Draw any chord $\overline{AB}$. Construct the perpendicular bisector of $\overline{AB}$ and examine if it passes through C.

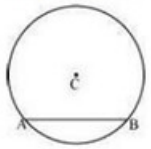
Answer:

(1) Mark any point C on the sheet.

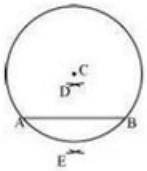
(2) By adjusting the compasses up to 3.4 cm and by putting the pointer of the compasses at point C, turn the compasses slowly to draw the circle. It is the required circle of 3.4 cm radius.



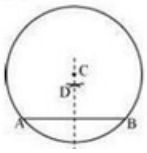
(3) Now, mark any chord $\overline{AB}$ in the circle.



(4) Taking A and B as centres, draw arcs on both sides of $\overline{AB}$. Let these intersect each other at D and E.



(5) Join DE, which is the perpendicular bisector of AB.



When $\overline{DE}$ is extended, it will pass through point C.

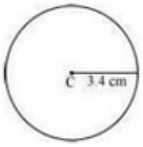
Question 7:

Repeat question 6, if $\overline{AB}$ happens to be a diameter.

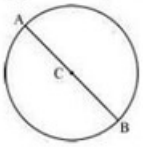
Answer:

(1) Mark any point C on the sheet.

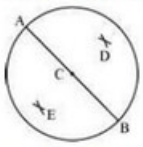
(2) By adjusting the compasses up to 3.4 cm and by putting the pointer of the compasses at point C, turn the compasses slowly to draw the circle. It is the required circle of 3.4 cm radius.



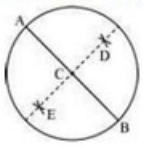
(3) Mark any diameter $\overline{AB}$ in the circle.



(4) Now, taking A and B as centres, draw arcs on both sides of $\overline{AB}$ taking radius more than $\overline{AB}$. Let these intersect each other at D and E.



(5) Join DE, which is the perpendicular bisector of AB.



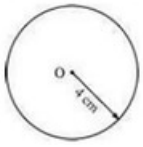
It can be observed that $\overline{DE}$ is passing through the centre C of the circle.

Question 8:

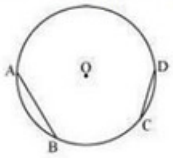
Draw a circle of radius 4 cm. Draw any two of its chords. Construct the perpendicular bisectors of these chords. Where do they meet?

Answer:

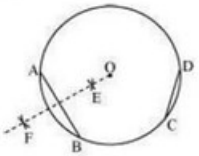
(1) Mark any point C on the sheet. Now, by adjusting the compasses up to 4 cm and by putting the pointer of compasses at point C, turn the compasses slowly to draw the circle. It is the required circle of 4 cm radius.



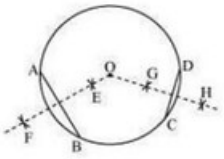
(2) Take any two chords $\overline{AB}$ and $\overline{CD}$ in the circle.



(3) Taking A and B as centres and with radius more than half of $\overline{AB}$, draw arcs on both sides of AB, intersecting each other at E, F. Join EF which is the perpendicular bisector of AB.



(4) Taking C and D as centres and with radius more than half of $\overline{CD}$, draw arcs on both sides of CD, intersecting each other at G, H. Join GH which is the perpendicular bisector of CD.



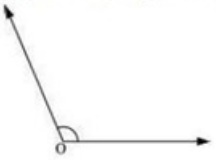
Now, we will find that when EF and GH are extended, they meet at the centre of the circle i.e., point O.

Question 9:

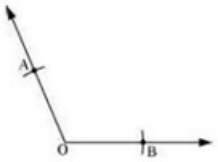
Draw any angle with vertex O. Take a point A on one of its arms and B on another such that OA = OB. Draw the perpendicular bisectors of $\overline{OA}$ and $\overline{OB}$.
Let them meet at P. Is PA = PB?

Answer:

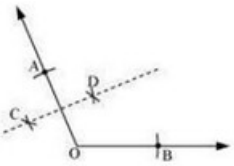
(1)Draw any angle whose vertex is O.



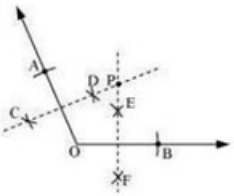
(2) With a convenient radius, draw arcs on both rays of this angle while taking O as centre. Let these points be A and B.



(3) Taking O and A as centres and with radius more than half of OA, draw arcs on both sides of OA. Let these be intersecting at C and D. Join CD.



(4) Similarly, we can find the perpendicular bisector $\overline{EF}$ of $\overline{OB}$. These perpendicular bisectors $\overline{CD}$ and $\overline{EF}$ will intersect each other at P.
Now, PA and PB can be measured. These are equal in length.

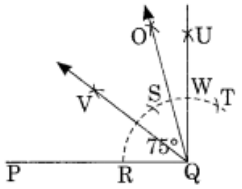


NCERT Solutions For Class 6 Maths Chapter 14 Practical Geometry Ex 14.6

Exercise 14.6

Ex 14.6 Class 6 Maths Question 1.
Draw ∠POQ of measure 75° and find its line of symmetry.
Solution:

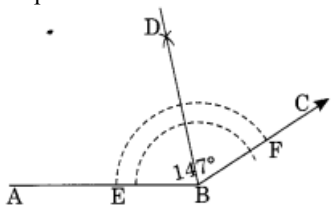
Step I : Draw a line segment $\overline{PQ}$.
Step II : With centre Q and suitable radius, draw an arc to cut PQ at R.



Step III : With centre R and radius of the same length, mark S and T on the former arc.
Step IV : With centres S and T and with the same radius, draw two arcs which meet each other at U.
Step V: Join QU such that ∠PQU = 90°.
Step VI : With centres S and W, draw two arcs of the same radius which meet each other at Q.
Step VII: Join Q and O such that ∠PQO = 75°.
Step VIII: Bisect ∠PQO with QV.
Thus, OV is the line of symmetry of ∠PQO.

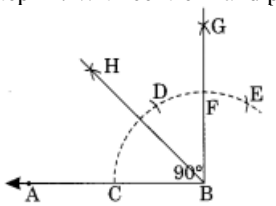
Ex 14.6 Class 6 Maths Question 2.
Draw an angle of measure 147° and construct its bisector.
Solution:

Step I : Draw ∠ABC = 147° with the help of protractor.



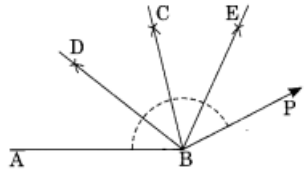
Step II : With centres B and radius of proper length, draw an arc which meets AB and AC at E and F respectively.
Step III : With centres E and F and the radius more that half of the length of arc EF, draw two arcs which meet each other at D.
Step IV : Join B and D.
Thus, BD is the bisector of ∠ABC.

Ex 14.6 Class 6 Maths Question 3.
Draw a right angle and construct its bisector.
Solution:
Step I: Draw a line segment AB.
Step II : With centre B and proper radius draw an arc to meet AB at C.



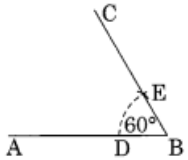
Step III : With centre C and same radius, mark two marks D and E on the former arc.
Step IV : With centres D and E and the same radius, draw two arcs which meet each other at G.
Step V : Join B and G such that ∠ABG = 90°
Step VI : Draw BH as the bisector of ∠ABG such that ∠ABH = 45°.
Thus ∠ABG is the right angle and BH is the bisector of ∠ABG.

Ex 14.6 Class 6 Maths Question 4.
Draw an angle of 153° and divide it into four equal parts.
Solution:
Step I : Draw ∠ABP = 153° with the help of protractor.



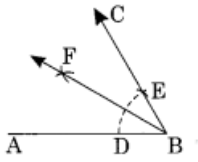
Step II : Draw BC as the bisector of ∠ABP which dividers ∠ABP into two equal parts.
Step III : Draw BD and BE as the bisector of ∠ABC and ∠CBP respectively.
Thus, the bisectors BD, BC and BE divide the ∠ABP into four equal parts.

Ex 14.6 Class 6 Maths Question 5.
Construct with ruler and compasses, angles of the following measures:
(a) 60°
(b) 30°
(c) 90°
(d) 120°
(e) 45°
(f) 135°
Solution:
(a) Angle of 60°



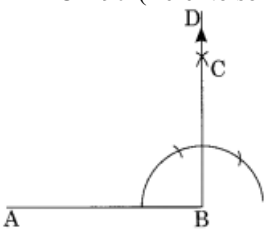
Step I: Draw a line segment $\overline{AB}$.
Step II : With centre B and proper radius draw an arc.
Step III : With centre D and radius of the- same length mark a point E on the former arc.
Step IV : Join B to E and product to C. Thus ∠ABC is the required angle of measure 60°.

(b) Step I: Draw ∠ABC = 60° as we have done in section (a).
Step II: Draw BF as the bisector of ∠ABC.



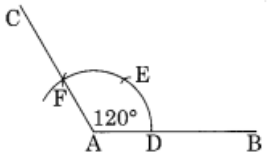
Thus $\angle ABF = \frac{60}{2} = 30°$.

(c) Angle of 90°
In the given figure,
$\angle ABC = 90°$(Refer to solution 3)



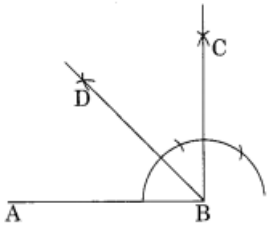
(d) Angle of 120°.

Step I: Draw $\overline{AB}$
Step II : With centre A and radius of proper length, draw an arc.

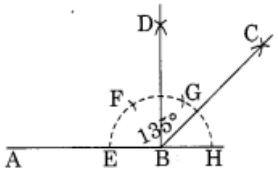


Step III : With centre D and the same radius, draw two mark E and F on former arc.
Step IV : Join A to F and produce to C. Thus $\angle CAB = 120°$

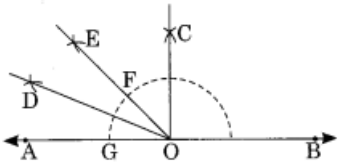
(e) Angle of 45s, i.e., $\frac{90}{2} = 45°$
In the figure $\angle ABD = 45°$ (Refer to solution 3)



(f) An angle of 135°
Since $135° = 90° + 45°$
$= 90° + (\frac{90}{2})°$
In this figure $\angle ABC = 135°$

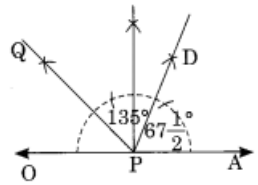


Ex 14.6 Class 6 Maths Question 6.
Draw an angle of measure 45° and bisect it.
Solution:
Step I : Draw a line AB and take any point O on it.
Step II: Construct $\angle AOE = 45°$ at O.



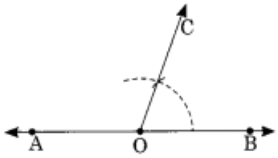
Step III: With centre O and proper radius, draw an arc GF.
Step IV : With centres G and F and proper radius, draw two arcs which intersect each other at D.
Step V : Join O to D.
Thus $\angle AOE = 45°$ and OD is its bisector.

Ex 14.6 Class 6 Maths Question 7.
Draw an angle of measure 135° and bisect it.
Solution:
Steps I: Draw a line OA and take any point P on it.



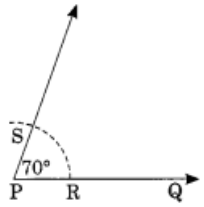
Step II: Construct ∠APQ = 135°.
Step III : Draw PD as the bisector of angle APQ.
Thus ∠APQ = $\frac{135^0}{2}$ = 67 $\frac{1^0}{2}$.

Ex 14.6 Class 6 Maths Question 8.
Draw an angle of 70°. Make a copy of it using only a straight edge and compasses.
Solution:
Step I : Draw a line AB and take any point 0 on it.
Step II : Draw ∠COB = 70° using protractor.



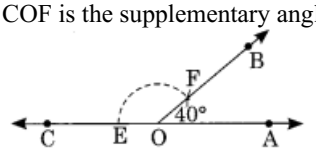
Step III: Draw a ray $\overrightarrow{PQ}$.

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



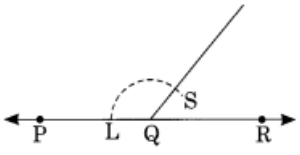
Step V : With the same radius and centre at P, draw an arc meeting $\overrightarrow{PQ}$ at R.
Step VI: With centre R and keeping and radius equal to EF, draw an arc intersecting the former arc at S.
Step VII : Join P and S and produce it. Thus, QPS is the copy of AOB = 70°.

Ex 14.6 Class 6 Maths Question 9.
Draw an angle of 40°. Copy its supplementary angle.
Solution:
Step I: Construct ∠AOB = 40° using protractor.
∠COF is the supplementary angle of ∠AOB.



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

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



Step IV : With centre Q and same radius, draw an arc which intersects $\overrightarrow{PQ}$ at L.
Step V: With centre L and radius equal to EF, draw an arc which intersects the former arc at S.
Step VI : Join Q and S and produce.
Thus, ∠PQS is the copy of the supplementary angle COB.

Question 2:

Draw an angle of measure 147° and construct its bisector.

Answer:

The below given steps will be followed to construct an angle of 147º measure and its bisector.

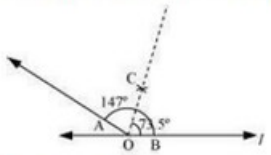
(1) Draw a line *l* and mark a point O on it. Place the centre of the protractor at point O and the zero edge along line *l*.

(2) Mark a point A at 147º. Join OA. OA is the required ray making 147º with line *l*.

(3) Draw an arc of convenient radius, while taking point O as centre. Let it intersect both rays of angle 147º at point A and B.

(4) Taking A and B as centres, draw arcs of radius more than $\frac{1}{2}$AB in the interior of angle of 147º. Let those intersect each other at C. Join OC.

OC is the required bisector of 147º angle.



Question 3:

Draw a right angle and construct its bisector.

Answer:

The below given steps will be followed to construct a right angle and its bisector.

(1) Draw a line *l* and mark a point P on it. Draw an arc of convenient radius, while taking point P as centre. Let it intersect line *l* at R.

(2) Taking R as centre and with the same radius as before, draw an arc intersecting the previously drawn arc at S.

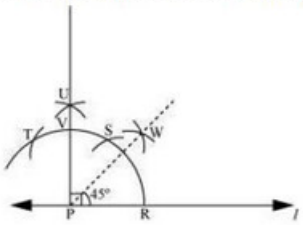
(3) Taking S as centre and with the same radius as before, draw an arc intersecting the arc at T (see figure).

(4) Taking S and T as centres, draw arcs of same radius to intersect each other at U.

(5) Join PU. PU is the required ray making 90º with line *l*. Let it intersect the major arc at point V.

(6) Now, taking R and V as centres, draw arcs with radius more than $\frac{1}{2}$RV to intersect each other at W. Join PW.

PW is the required bisector of this right angle.



Question 4:

Draw an angle of measure153° and divide it into four equal parts.

Answer:

The below given steps will be followed to construct an angle of 153º measure and its bisector.

(1) Draw a line *l* and mark a point O on it. Place the centre of the protractor at point O and the zero edge along line *l*.

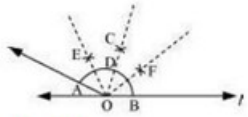
(2) Mark a point A at 153º. Join OA. OA is the required ray making 153º with line *l*.

(3) Draw an arc of convenient radius, while taking point O as centre. Let it intersect both rays of angle 153º at point A and B.

(4) Taking A and B as centres, draw arcs of radius more than $\frac{1}{2}$ AB in the interior of angle of 153º. Let those intersect each other at C. Join OC.

(5) Let OC intersect the major arc at point D. Now, with radius more than $\frac{1}{2}$ AD, draw arcs while taking A and D as centres, and D and B as centres. Let these be intersecting each other at point E and F respectively. Join OE, OF.

OF, OC, OE are the rays dividing 153º angle in 4 equal parts.



Construct with ruler and compasses, angles of following measures:

(a) 60° (b) 30° (c) 90°

(d) 120° (e) 45° (f) 135°

Answer:

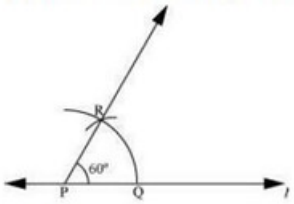
(a) 60°

The below given steps will be followed to construct an angle of 60°.

(1) Draw a line *l* and mark a point P on it. Now, taking P as centre and with a convenient radius, draw an arc of a circle which intersects line *l* at Q.

(2) Taking Q as centre and with the same radius as before, draw an arc intersecting the previously drawn arc at point R.

(3) Join PR which is the required ray making 60° with line *l*.



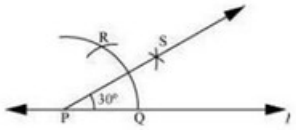
(b) 30°

The below given steps will be followed to construct an angle of 30°.

(1) Draw a line *l* and mark a point P on it. Now taking P as centre and with convenient radius, draw an arc of a circle which intersects line *l* at Q.

(2) Taking Q as centre and with the same radius as before, draw an arc intersecting the previously drawn arc at point R.

(3) Now, taking Q and R as centre and with radius more than $\frac{1}{2}$RQ, draw arcs to intersect each other at S. Join PS which is the required ray making 30° with line *l*.



(c) 90°

The below given steps will be followed to construct an angle of 90°.

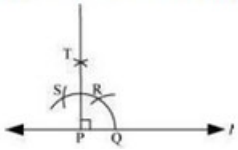
(1) Draw a line *l* and mark a point P on it. Now taking P as centre and with a convenient radius, draw an arc of a circle which intersects line *l* at Q.

(2) Taking Q as centre and with the same radius as before, draw an arc intersecting the previously drawn arc at R.

(3) Taking R as centre and with the same radius as before, draw an arc intersecting the arc at S (see figure).

(4) Taking R and S as centre, draw an arc of same radius to intersect each other at T.

(5) Join PT, which is the required ray making 90° with line *l*.



(d) 120°

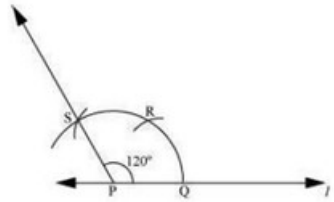
The below given steps will be followed to construct an angle of 120°.

(1) Draw a line *l* and mark a point P on it. Now taking P as centre and with a convenient radius, draw an arc of a circle which intersects line *l* at Q.

(2) Taking Q as centre and with the same radius as before, draw an arc intersecting the previously drawn arc at R.

(3) Taking R as centre and with the same radius as before, draw an arc intersecting the arc at S (see figure).

(4) Join PS, which is the required ray making 120° with line *l*.



(e)45°

The below given steps will be followed to construct an angle of 45°.

(1) Draw a line *l* and mark a point P on it. Now taking P as centre and with a convenient radius, draw an arc of a circle which intersects line *l* at Q.

(2) Taking Q as centre and with the same radius as before, draw an arc intersecting the previously drawn arc at R.

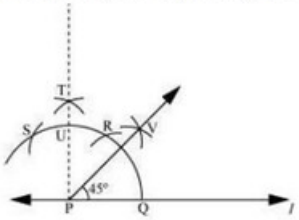
(3) Taking R as centre and with the same radius as before, draw an arc intersecting the arc at S (see figure).

(4) Taking R and S as centres, draw arcs of same radius to intersect each other at T.

(5) Join PT. Let it intersect the major arc at point U.

(6) Taking Q and U as centres, draw arcs with radius more than $\frac{1}{2}$ QU to intersect each other at V. Join PV.

PV is the required ray making 45° with the given line *l*.



(f) 135°

The below given steps will be followed to construct an angle of 135°.

(1) Draw a line *l* and mark a point P on it. Now taking P as centre and with a convenient radius, draw a semi-circle which intersects line *l* at Q and R.

(2) Taking R as centre and with the same radius as before, draw an arc intersecting the previously drawn arc at S.

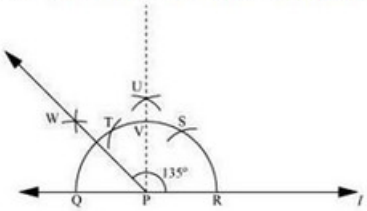
(3) Taking S as centre and with the same radius as before, draw an arc intersecting the arc at T (see figure).

(4) Taking S and T as centre, draw arcs of same radius to intersect each other at U.

(4) Taking S and T as centre, draw arcs of same radius to intersect each other at U.

(5) Join PU. Let it intersect the arc at V. Now taking Q and V as centres and with radius more than $\frac{1}{2}$ QV, draw arcs to intersect each other at W.

(6) Join PW which is the required ray making 135° with line *l*.



Question 7:

Draw an angle of measure 135° and bisect it.

Answer:

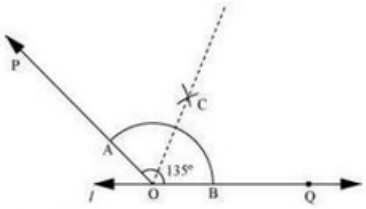
The below given steps will be followed to construct an angle of 135° and its bisector.

(1) ĐPOQ of 135º measure can be formed on a line *l* by using the protractor.

(2) Draw an arc of a convenient radius, while taking point O as centre. Let it intersect both rays of angle 135º at point A and B.

(3) Taking A and B as centres, draw arcs of radius more than $\frac{1}{2}$ AB in the interior of angle of 135º. Let those intersect each other at C. Join OC.

OC is the required bisector of 135º angle.



Question 8:

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

Answer:

The below given steps will be followed to construct an angle of 70º measure and its copy.

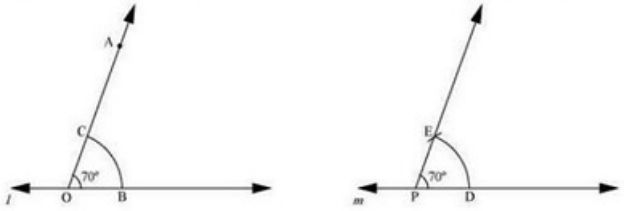
(1) Draw a line *l* and mark a point O on it. Place the centre of the protractor at point O and the zero edge along line *l*.

(2) Mark a point A at 70º. Join OA. OA is the ray making 70º with line *l*. Draw an arc of convenient radius in the interior of 70º angle, while taking point O as centre. Let it intersect both rays of angle 70º at point B and C.

(3) Draw a line *m* and mark a point P on it. With the same radius as used before, again draw an arc while taking point P as centre. Let it cut the line *m* at point D.

(4) Now, adjust the compasses up to the length of BC. With this radius, draw an arc while taking D as centre, which will intersect the previously drawn arc at point E.

(5) Join PE. PE is the required ray which makes the same angle (i.e. 70º) with line *m*.



Question 9:

Draw an angle of 40°. Copy its supplementary angle.

Answer:

The below given steps will be followed to construct an angle of 40º measure and the copy of its supplementary angle.

(1) Draw a line segment $\overline{PQ}$ and mark a point O on it. Place the centre of the protractor at point O and the zero edge along line segment $\overline{PQ}$.

(2) Mark a point A at 40º. Join OA. OA is the required ray making 40º with $\overline{PQ}$. Ð POA is the supplementary angle of 40º.

(3) Draw an arc of convenient radius in the interior of Ð POA, while taking point O as centre. Let it intersect both rays of Ð POA at point B and C.

(4) Draw a line *m* and mark a point S on it. With the same radius as used before, again draw an arc while taking point S as centre. Let it cut the line *m* at point T.

(5) Now, adjust the compasses up to the length of BC. With this radius, draw an arc while taking T as centre, which will intersect the previously drawn arc at point R.

(6) Join RS. RS is the required ray which makes the same angle with line *m*, as the supplementary of 40º is 140º.