



NCERT SOLUTIONS FOR CLASS 6 MATHS PRACTICAL GEOMETRY EXERCISE 14.5

Exercise 14.3

Question 1:

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

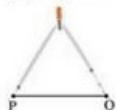
Answer:

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} .

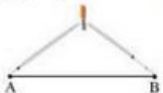
Answer:

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} .



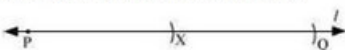
- (3) Draw any line l and mark a point P on it.



- (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.



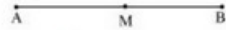
Exercise 14.4

Question 1:

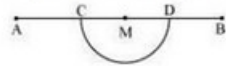
Draw any line segment \overline{AB} . Mark any point M on it. Through M, draw a perpendicular to \overline{AB} . (Use ruler and compasses)

Answer:

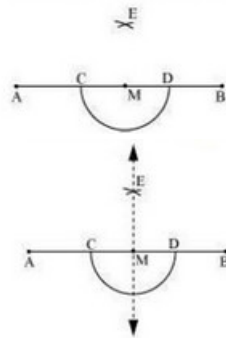
- (1) Draw the given line segment \overline{AB} and mark any point M on it.



- (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.

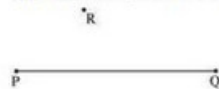


Question 2:

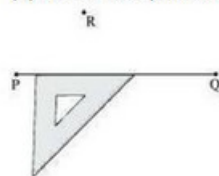
Draw any line segment \overline{PQ} . Take any point R not on it. Through R, draw a perpendicular to \overline{PQ} . (Use ruler and set-square)

Answer:

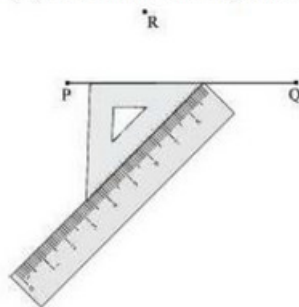
- (1) Take the given line segment \overline{PQ} and mark any point R outside \overline{PQ} .



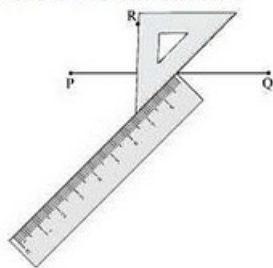
- (2) Place a set square on \overline{PQ} such that one arm of its right angle aligns along \overline{PQ} .



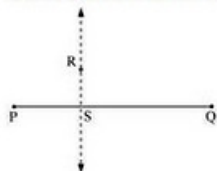
- (3) Place the ruler along the edge opposite to the right angle of the set square.



- (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 .

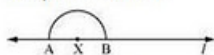
Now draw a perpendicular to \overline{XY} at Y. (use ruler and compasses)

Answer:

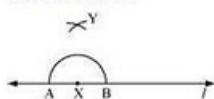
- (1) Draw a line l and mark a point X on it.



- (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.

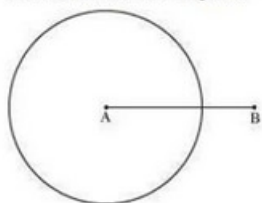
Answer:

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

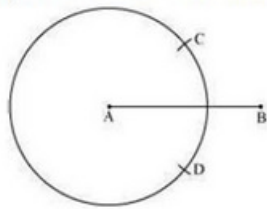
- (1) Draw a line segment \overline{AB} of 7.3 cm.



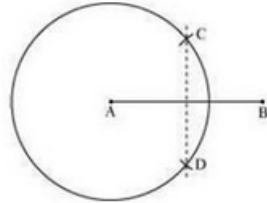
- (2) Taking A as centre, draw a circle by using compasses. The radius of circle should be more than half the length of \overline{AB} .



(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.

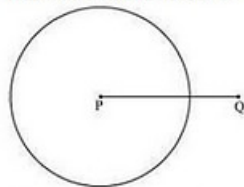
Answer:

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

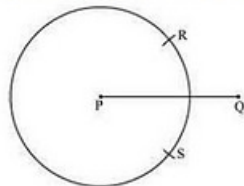
(1) Draw a line segment \overline{PQ} of 9.5 cm.



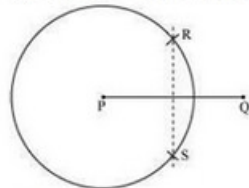
(2) Taking P as centre, draw a circle by using compasses. The radius of circle should be more than half the length of \overline{PQ} .



(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 $PX = PY$.

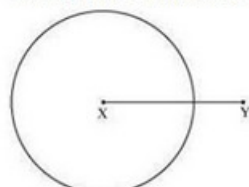
(b) If M is the mid point of \overline{XY} , what can you say about the lengths MX and MY?

Answer:

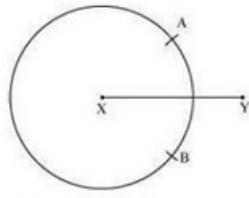
(1) Draw a line segment \overline{XY} of 10.3 cm.



(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:

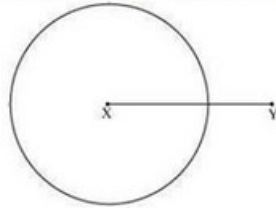
Draw a line segment of length 12.8 cm. Using compasses; divide it into four equal parts. Verify by actual measurement.

Answer:

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

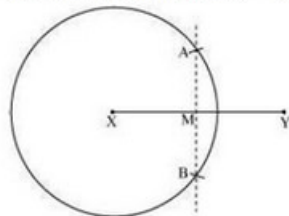


- (2) Draw a circle, while taking point X as centre and radius more than half of XY.

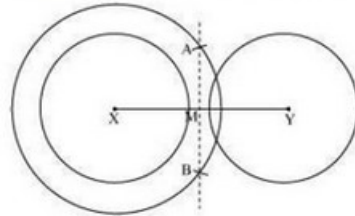


- (3) With same radius and taking centre as Y, again draw arcs to cut the circle at A and B.

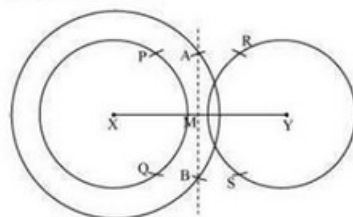
B. Join AB which intersects \overline{XY} at M.



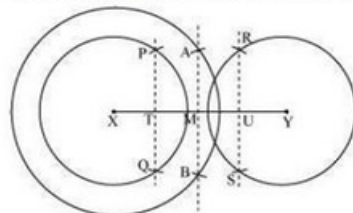
- (4) Taking X and Y as centres, draw two circles with radius more than half of \overline{XM} .



- (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:

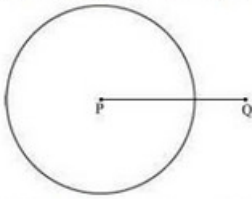
With \overline{PQ} of length 6.1 cm as diameter draw a circle.

Answer:

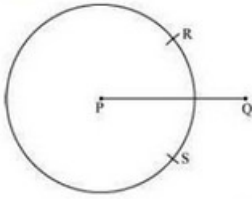
- (1) Draw a line segment \overline{PQ} of 6.1 cm.



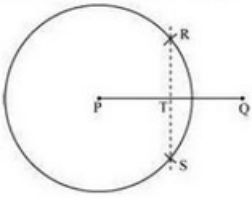
- (2) Taking point P as centre and radius more than half of \overline{PQ} , draw a circle.



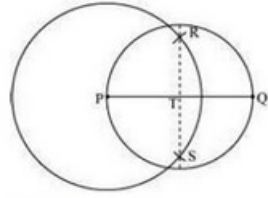
- (3) With same radius and taking Q as centre, draw arcs to intersect this circle at points R and S.



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



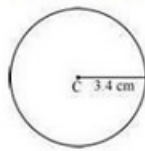
- (5) Taking T as centre and with radius TP, draw a circle which will also pass through Q. It is the required circle.

**Question 6:**

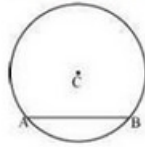
Draw a circle with centre C and radius 3.4 cm. Draw any chord \overline{AB} . Construct the perpendicular bisector of \overline{AB} and examine if it passes through C.

Answer:

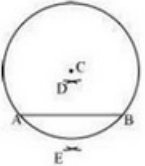
- (1) Mark any point C on the sheet.
- (2) By adjusting the compasses up to 3.4 cm and by putting the pointer of the compasses at point C, turn the compasses slowly to draw the circle. It is the required circle of 3.4 cm radius.



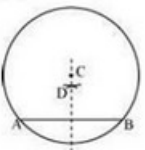
(3) Now, mark any chord \overline{AB} in the circle.



(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.

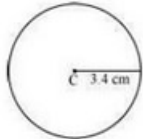
Question 7:

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

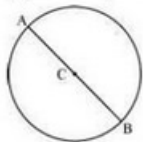
Answer:

(1) Mark any point C on the sheet.

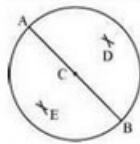
(2) By adjusting the compasses up to 3.4 cm and by putting the pointer of the compasses at point C, turn the compasses slowly to draw the circle. It is the required circle of 3.4 cm radius.



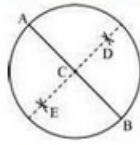
(3) Mark any diameter \overline{AB} in the circle.



(4) Now, taking A and B as centres, draw arcs on both sides of \overline{AB} taking radius more than $\frac{1}{2}\overline{AB}$. 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:

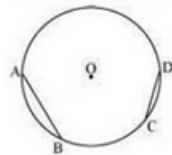
Draw a circle of radius 4 cm. Draw any two of its chords. Construct the perpendicular bisectors of these chords. Where do they meet?

Answer:

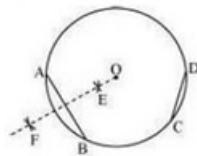
(1) Mark any point C on the sheet. Now, by adjusting the compasses up to 4 cm and by putting the pointer of compasses at point C, turn the compasses slowly to draw the circle. It is the required circle of 4 cm radius.



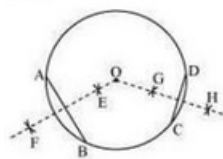
(2) Take any two chords \overline{AB} and \overline{CD} in the circle.



(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.



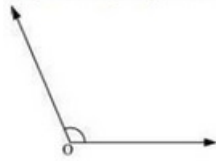
Now, we will find that when EF and GH are extended, they meet at the centre of the circle i.e., point O.

Question 9:

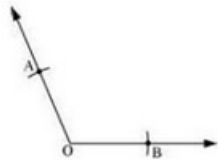
Draw any angle with vertex O. Take a point A on one of its arms and B on another such that $OA = OB$. Draw the perpendicular bisectors of \overline{OA} and \overline{OB} . Let them meet at P. Is $PA = PB$?

Answer:

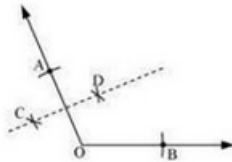
(1) Draw any angle whose vertex is O.



(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.

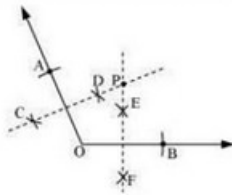


(3) Taking O and A as centres and with radius more than half of OA, draw arcs on both sides of OA. Let these be intersecting at C and D. Join CD.



(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.



***** END *****