

Board- CBSE	Std- 6	Topic- Practical Geometry	Solved Questions
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1. Construct two line segments of length 4.3 cm and 3.2 cm. Construct a line segment whose length is equal to the sum of the lengths of these segments.

Solution:

With the help of a compass and ruler, construct AB and CD of lengths 4.3 cm and 3.2 cm respectively.

Construct a line L and mark a point P on it.

Now place the metal point of the compass at the zero mark of the ruler.

Make adjustments in the compass such that the pencil point reaches point B.

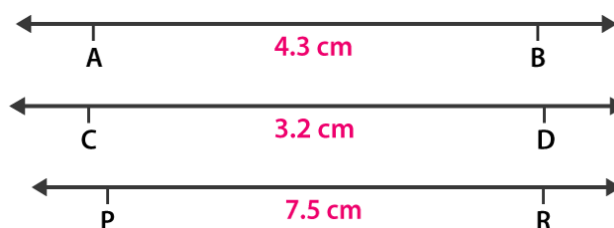
Take compass to L such that its metal point is on point P.

Now mark a small mark at Q on the line L corresponding to the pencil point of the compass.

Reset the compass so that its metal and pencil points are on C and D.

Take the compass to L such that its metal point is on Q and the pencil point makes a small mark at R which is opposite to P on L.

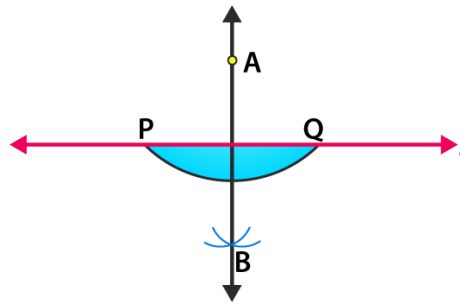
Here, PR is the required segment having lengths equal to the sum of lengths of these segments.



2. Draw a line l. Take a point A, not lying on l. Draw a line m such that  $m \perp l$  and passing through A.

(Using (i) ruler and a set-square (ii) ruler and compasses)

Solution:



(i) Construct a line L and mark a point A outside it.

Now place the set square PQR with its one arm PQ of the right angle along the line L. Place the ruler along the edge PR without disturbing the position of the set square. Slide the set square along the ruler till its arm QR reaches A without disturbing the position of the ruler.

Draw a line m.

Here, line m is the required line that is perpendicular to line L.

(ii) Considering A as the center, construct an arc PQ that intersects the line L at P and Q.

By taking P and Q as centers, draw two arcs that intersect each other at point B.

Now join points A and B and extend in both directions.

Here, AB is the required line.

4. Using a protractor, draw  $\angle BAC$  of measure  $45^\circ$ . Take a point P in the interior of  $\angle BAC$ . From P draw line segments PM and PN such that  $PM \perp AB$  and  $PN \perp AC$ , Measure  $\angle MPN$ .

Solution:

(i) Construct a line segment A on line L.

(ii) Place the protractor on the line segment AC such that it coincides with the line of the diameter of the protractor and the middle point of the line coincides with A.

(iii) By counting from the right side, mark B as the point of  $45^\circ$  of the protractor. Join AB.

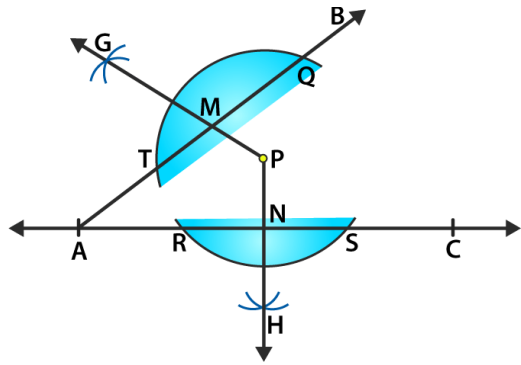
(iv) Taking P as the center and a convenient radius, draw an arc that intersects the line segment AB at point T and Q and AC at point R and S.

(v) Taking T and Q as centers and the same radius, draw two arcs that intersect at point G on the other side.

(vi) Taking R and S as centers and the same radius, draw two arcs that intersect at point H on the other side.

(vii) Now join the points PG and PH that intersect the line segments AB and AC at points M and N.

By measuring  $\angle MPN$  with the help of a protractor, we get,  $\angle MPN = 135^\circ$ .



5. Draw a line segment AB of length 5.8 cm. Draw the perpendicular bisector of this line segment.

Solution:

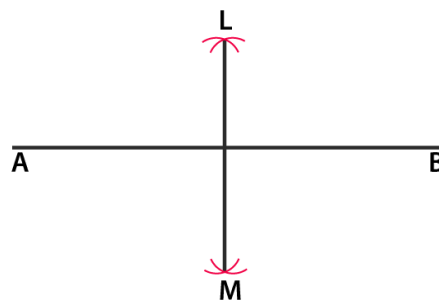
Construct a line segment AB of length 5.8 cm with the help of a ruler.

Taking A as the center and radius more than half of AB, construct arcs on both sides of the line segment AB.

Taking B as center and the same radius, construct arcs on both sides of AB which intersects the previous arcs at the points L and M.

Construct the line segment LM with L and M as the endpoints.

Here, LM is the required perpendicular bisector of AB.



6. Draw a circle with center at point O and radius of 5 cm. Draw its chord AB and the perpendicular bisector of line segment AB. Does it pass through the center of the circle?

Solution:

Take a point O. By considering O as center and radius equal to 5 cm, construct a circle.

Now take points A and B on the circumference of the circle and construct a line segment with points A and B as its endpoints.

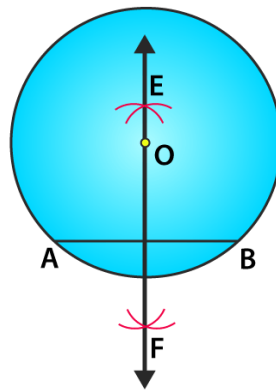
Here AB is the chord of the circle.

Taking A as center and radius more than half of AB, construct arcs on both sides of AB.

Taking B as center and the same radius, construct arcs on both sides of AB which cuts the previous arcs at the points E and F.

Construct a line passing through the points E and F.

Here, the line EF passes through the center O of the circle.



7. Draw a line segment AB and by ruler and compasses, obtain a line segment of length  $\frac{3}{4}$  (AB).

Solution:

Construct a line segment AB with the help of a ruler.

(i) Taking A as center and radius more than half of AB construct arcs on both sides of AB.

(ii) Taking B as center and the same radius construct arcs which cuts the previous arcs at the points P and Q.

(iii) Now join the points P and Q such that the line intersects AB at point C.

(i) Taking A as center and radius more than half of AC construct arcs on both sides of AC.

(ii) Taking C as center and the same radius construct arcs which cuts the previous arcs at the points R and S.

(iii) Now join the points R and S such that the line intersects AB at point D.

Bisect AC and mark D as the point of bisection.

We know that

$$AD = \frac{1}{4} (AB)$$

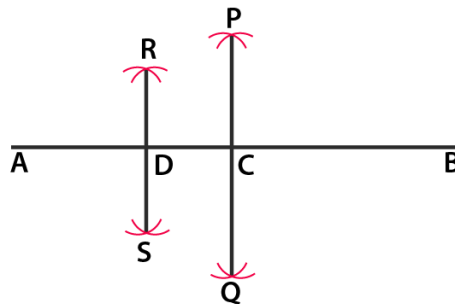
It can be written as

$$DC = \frac{1}{4} (AB) \text{ and } CB = \frac{1}{2} (AB)$$

So we get

$$DB = \frac{1}{4} (AB) + \frac{1}{2} (AB) = \frac{3}{4} (AB)$$

Hence, DB is the required line segment having length  $\frac{3}{4} (AB)$ .



8. Using your protractor, draw an angle of measurement  $108^\circ$ . With this angle, draw an angle of  $54^\circ$ .

Solution:

Construct a ray OA.

Using a protractor, draw an angle  $\angle AOB$  of  $108^\circ$  where  $108/2 = 54^\circ$

Hence,  $54^\circ$  is half of  $108^\circ$ .

In order to get angle  $54^\circ$ , we must bisect the angle of  $108^\circ$ .

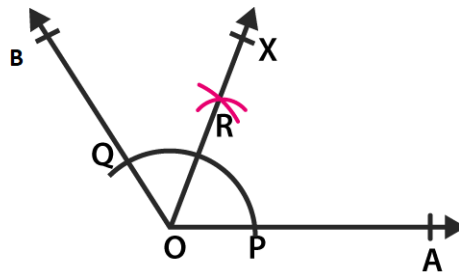
Taking O as the center and a convenient radius, construct an arc that cuts the sides OA and OB at the points P and Q.

Taking P as center and radius which is more than half of PQ, construct an arc.

Taking Q as center and the same radius construct another arc that intersects the previous arc at the point R.

Now join the points O and R and extend to point X.

Here,  $\angle AOX$  is the required angle of  $54^\circ$ .



9. Using a protractor, draw an angle of measurement  $72^\circ$ . With this angle as given, draw angles of measurement  $36^\circ$  and  $54^\circ$ .

Solution:

Construct a ray OA.

Using a protractor construct  $\angle AOB$  of  $72^\circ$

Taking O as the center and convenient radius, construct an arc that cuts sides OA and OB at points P and Q.

Taking P and Q as centers and radius more than half of PQ, construct two arcs that cut each other at the point R.

Now join the points O and R and extend to point X.

Here, OR intersects the arc PQ at point C.

Taking C and Q as centers and radius more than half of CQ, construct two arcs that cut each other at point T.

Now join the points O and T and extend it to the point Y.

OX bisects  $\angle AOB$

It can be written as

$$\angle AOX = \angle BOX = 72/2 = 36^\circ$$

OY bisects  $\angle BOX$

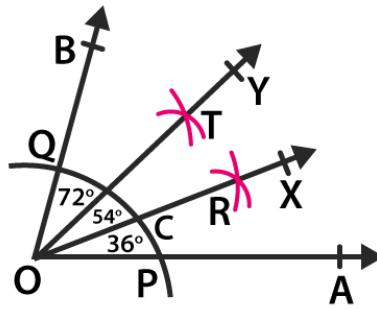
It can be written as

$$\angle XOY = \angle BOY = 36/2 = 18^\circ$$

We know that

$$\angle AOY = \angle AOX + \angle XOY = 36^\circ + 18^\circ = 54^\circ$$

Here,  $\angle AOX$  is the required angle of  $36^\circ$  and  $\angle AOY$  is the required angle of  $54^\circ$ .



10. Construct a rectangle whose adjacent sides are 8 cm and 3 cm.

Solution:

Construct a line segment AB of length 8 cm.

Draw  $\angle BAX = 90^\circ$  at A and  $\angle ABY = 90^\circ$  at B

With the help of a compass and ruler, mark a point D on the ray AX where  $AD = 3$  cm

In the same way, mark the point C on the ray Y where  $BC = 3$  cm

Construct the line segment CD.

Hence, ABCD is the required rectangle.

