17. Construction of Quadrilaterals

Exercise 17A

1. Question

Construct a quadrilateral ABCD in which AB= 4.2cm, BC= 6cm, CD=5.2cm, DA=5cm and AC= 8 cm.

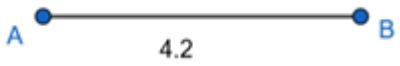
Answer

Given :

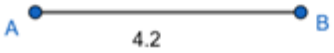
AB = 4.2 cm , BC = 6 cm , CD = 5.2 cm , DA = 5 cm , AC = 8 cm ,

Construction :

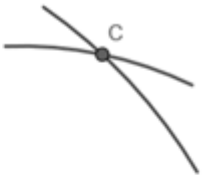
Step 1 : Draw segment AB of length 4.2 cm.

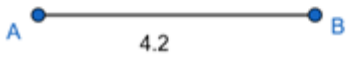


Step 2 : Taking A as centre draw an arc of radius 8 cm.

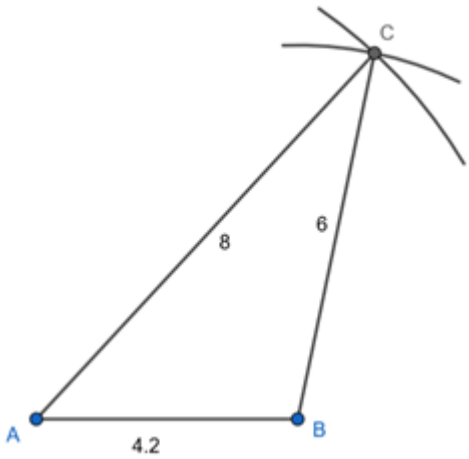


Step 3 : Taking B as centre draw an arc of radius 6 cm, which cuts the arc drawn in step 2. Point of intersection of two arcs is C.

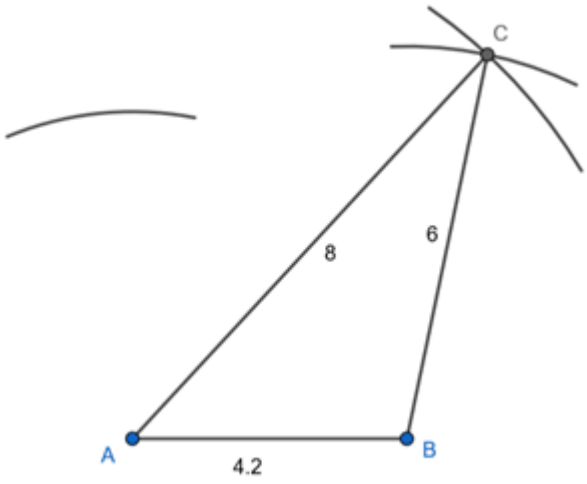




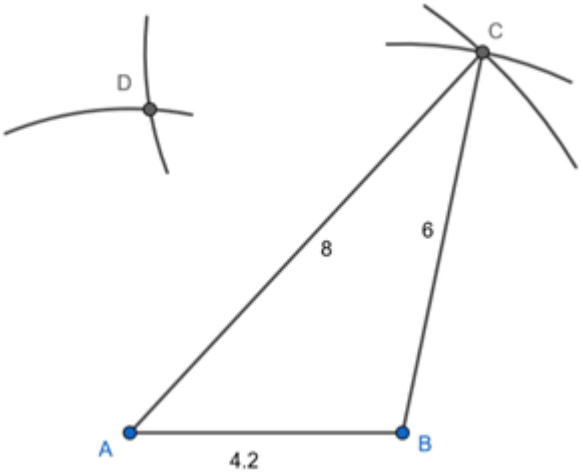
Step 4 : Join AC and BC.



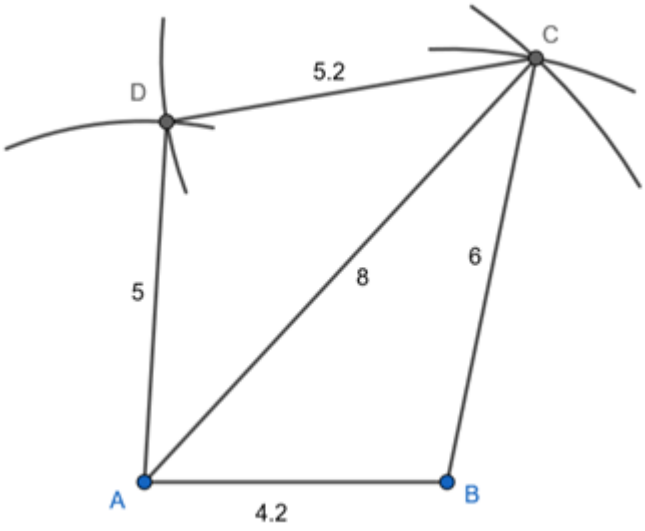
Step 5 : Taking A as centre draw an arc of radius 5 cm.



Step 6 : Taking C as centre draw an arc of radius 5.2 cm, which cuts the arc drawn in step 5. Point of intersection of two arcs is D.



Step 7 : Join AD and CD.



ABCD is the required quadrilateral.

2. Question

Construct a quadrilateral PQRS in which PQ=5.4cm, QR=4.6cm, RS=4.3cm, SP= 3.5cm and diagonal PR=4cm.

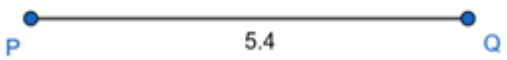
Answer

Given :

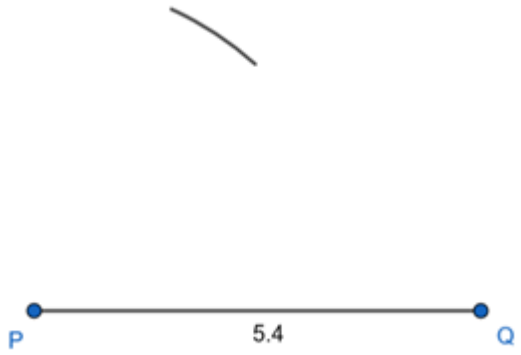
PQ = 5.4 cm , QR = 4.6 cm , RS = 4.3 cm , SP = 3.5 cm , PR = 4 cm.

Construction :

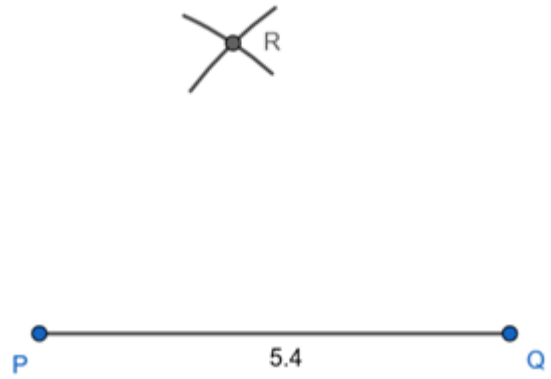
Step 1 : Draw segment PQ of length 5.4 cm.



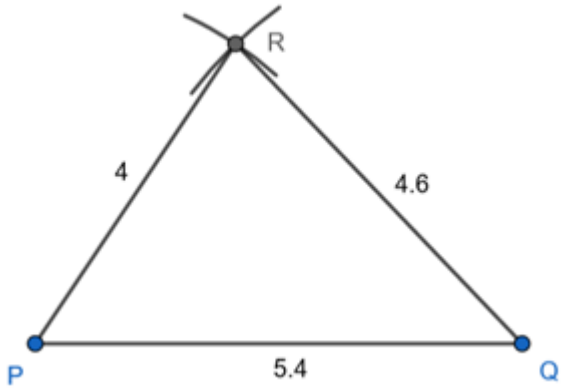
Step 2 : Taking P as centre draw an arc of radius 4 cm.



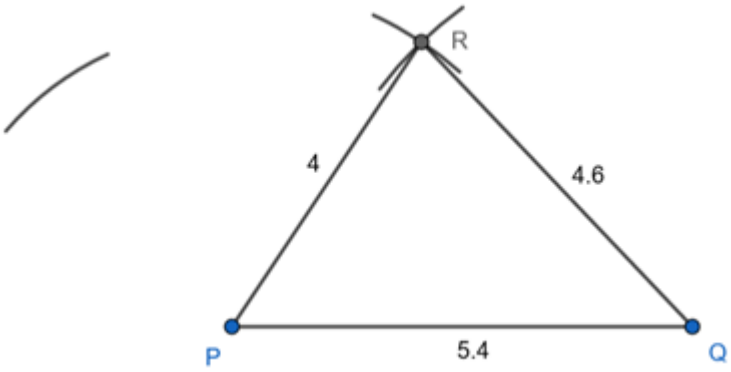
Step 3 : Taking Q as centre draw an arc of radius 4.6 cm, which cuts the arc drawn in step 2. Point of intersection of two arcs is R.



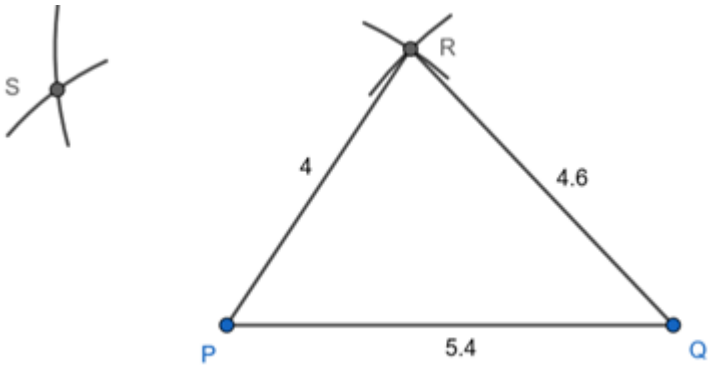
Step 4 : Join PR and QR.



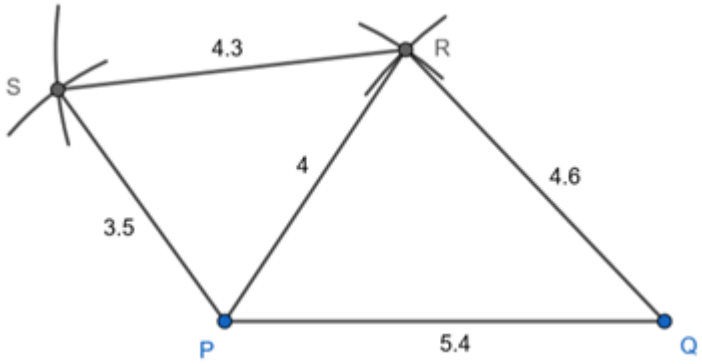
Step 5 : Taking P as centre draw an arc of radius 3.5 cm.



Step 6 : Taking R as centre draw an arc of radius 4.3 cm, which cuts the arc drawn in step 5. Point of intersection of two arcs is S.



Step 7 : Join PS and RS.



PQRS is the required quadrilateral.

3. Question

Construct a quadrilateral ABCD in which AB=3.5cm, BC=3.58cm, CD=DA=4.5 cm and diagonal BD=5.6cm.

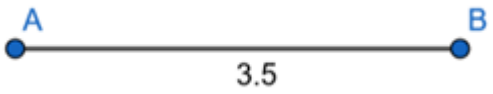
Answer

Given :

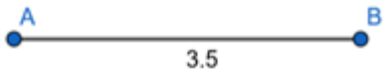
AB = 3.5 cm , BC = 3.58 cm , CD = DA = 4.5 cm , BD = 5.6 cm.

Construction :

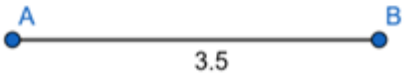
Step 1 : Draw segment AB of length 3.5 cm.



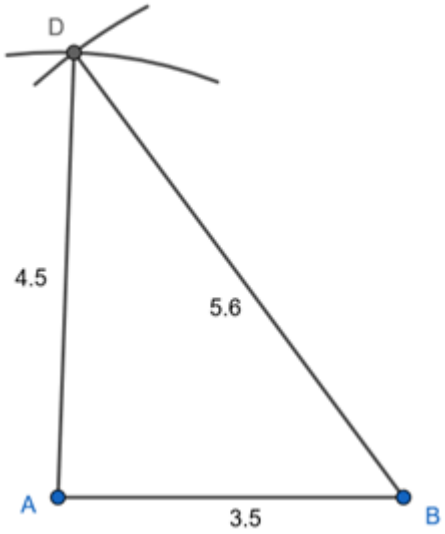
Step 2 : Taking A as centre draw an arc of radius 4.5 cm.



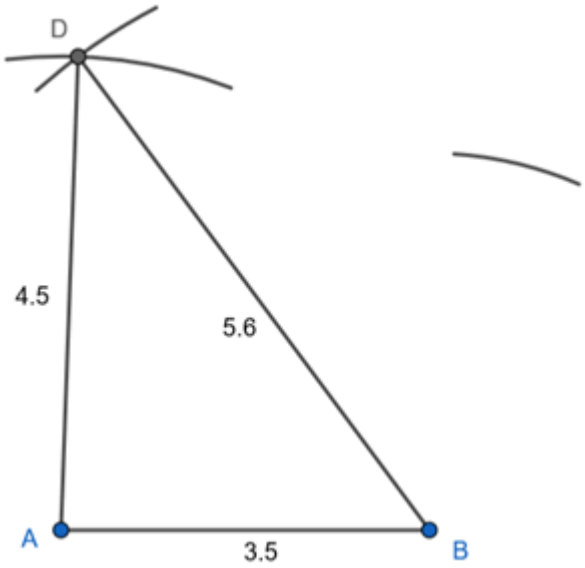
Step 3 : Taking B as centre draw an arc of radius 5.6 cm, which cuts the arc drawn in step 2. Point of intersection of two arcs is D.



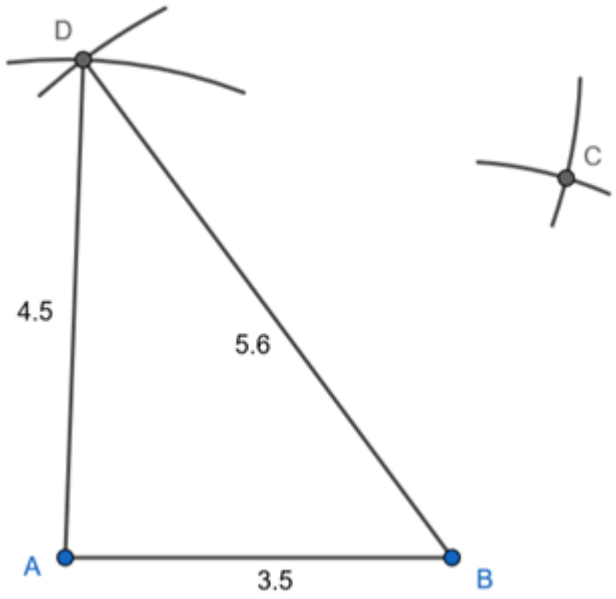
Step 4 : Join AD and BD.



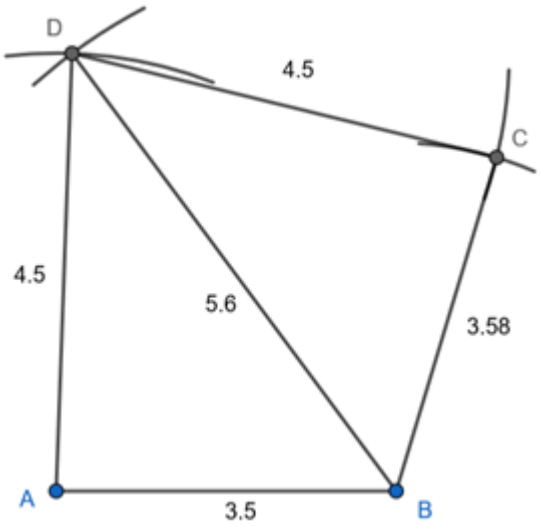
Step 5 : Taking B as centre draw an arc of radius 3.58 cm.



Step 6 : Taking D as centre draw arc of radius 4.5 cm, which cuts the arc drawn in step 5. Point of intersection of two arcs is C.



Step 7 : Join BC and CD.



ABCD is the required quadrilateral.

4. Question

Construct a quadrilateral ABCD in which AB=3.6cm, BC=3.3cm, AD=2.7cm, diagonal AC=4.6cm and diagonal BD=4cm.

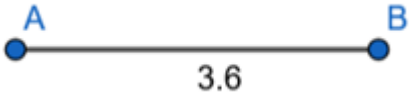
Answer

Given :

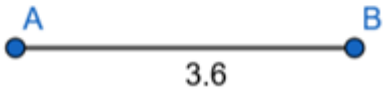
AB = 3.6 cm , BC = 3.3 cm , AD = 2.7 cm , AC = 4.6 cm , BD = 4 cm.

Construction :

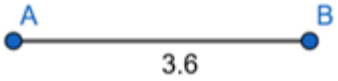
Step 1 : Draw segment AB of length 3.6 cm.



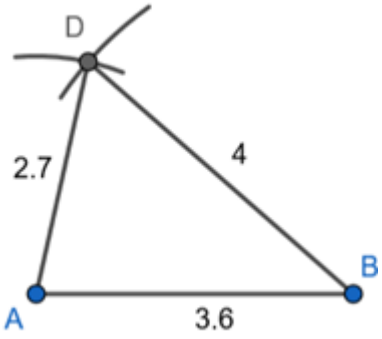
Step 2 : Taking A as centre draw an arc of radius 2.7 cm.



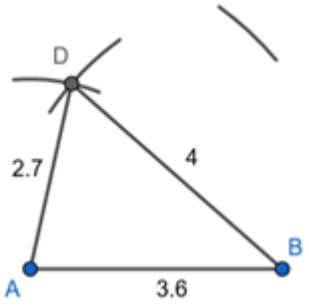
Step 3 : Taking B as centre draw an arc of radius 4 cm, which cuts the arc drawn in step 2. Point of intersection of two arcs is D.



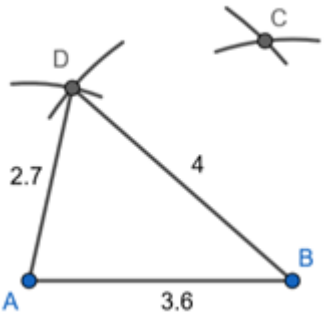
Step 4 : Join AD and BD.



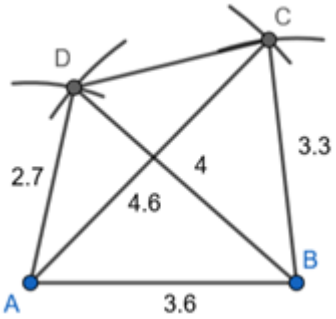
Step 5 : Taking A as centre draw an arc of radius 4.6 cm.



Step 6 : Taking B as centre draw an arc of radius 3.3 cm, which cuts the arc drawn in step 5. Point of intersection of two arcs is C.



Step 7 : Join BC , AC and CD.



ABCD is the required quadrilateral.

5. Question

Construct a quadrilateral PQRS in which QR=7.5cm, PR=PS=6cm, RS=5cm, QS=10cm. Measure the fourth side.

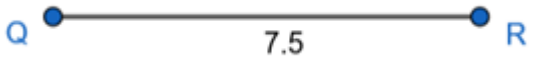
Answer

Given :

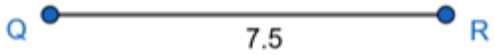
QR = 7.5 cm , PR = PS = 6 cm , RS = 5 cm , QS = 10 cm.

Construction :

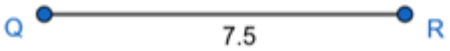
Step 1 : Draw segment QR of length 7.5 cm.



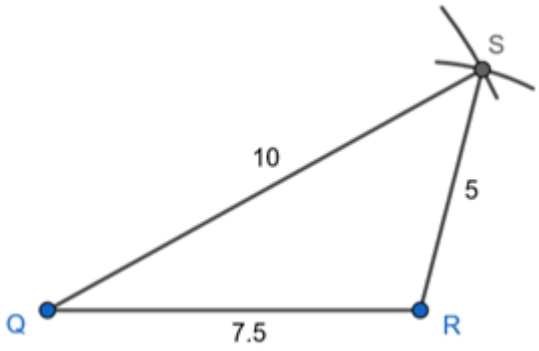
Step 2 : Taking Q as centre draw an arc of radius 10 cm.



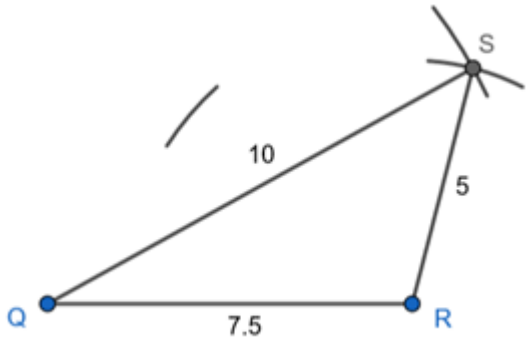
Step 3 : Taking R as centre draw an arc of radius 5 cm, which cuts the arc drawn in step 2. Point of intersection of two arcs is S.



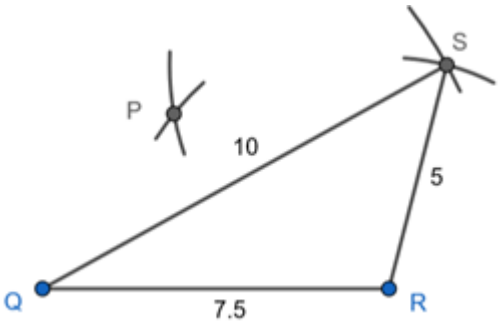
Step 4 : Join QS and SR.



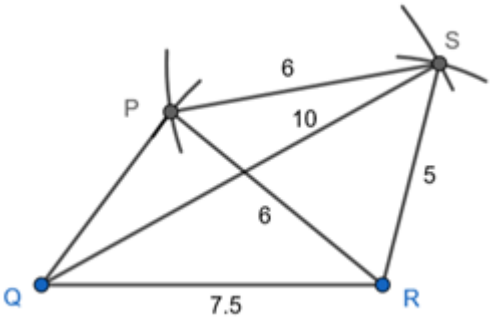
Step 5 : Taking R as centre draw an arc of radius 6 cm.



Step 6 : Taking S as centre draw an arc of radius 6 cm, which cuts the arc drawn in step 5. Point of intersection of two arcs is P.

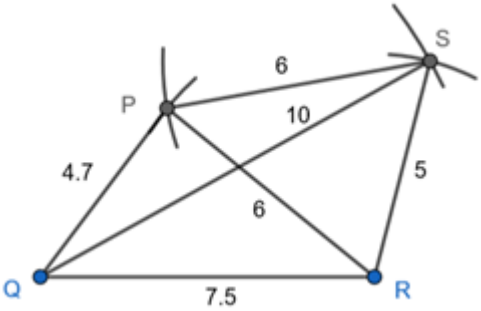


Step 7 : Join PQ , PR and PS.



PQRS is the required quadrilateral.

Step 8 : Measure length of PQ .



Length of fourth side PQ = 4.7 cm.

6. Question

Construct a quadrilateral ABCD in which AB=3.4cm, CD= 3cm, DA=5.7cm, AC=8cm and BD=4cm.

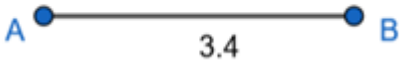
Answer

Given :

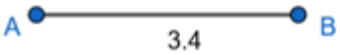
AB = 3.4 cm , CD = 3 cm , DA = 5.7 cm , AC = 8 cm , BD = 4 cm.

Construction :

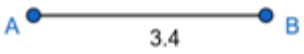
Step 1 : Draw segment AB of length 3.4 cm.



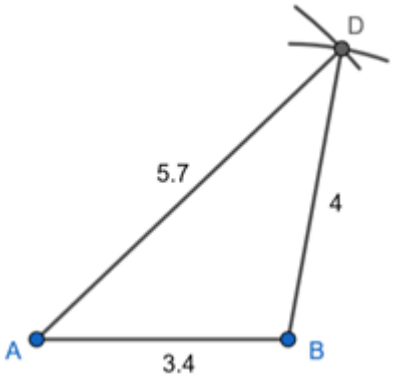
Step 2 : Taking A as centre draw an arc of radius 5.7 cm.



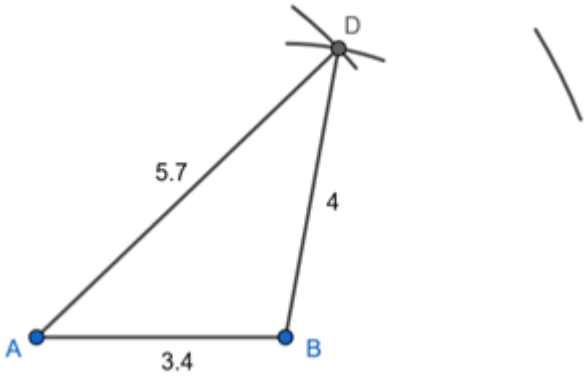
Step 3 : Taking B as centre draw an arc of radius 4 cm, which cuts the arc drawn in step 2. Point of intersection of two arcs is D.



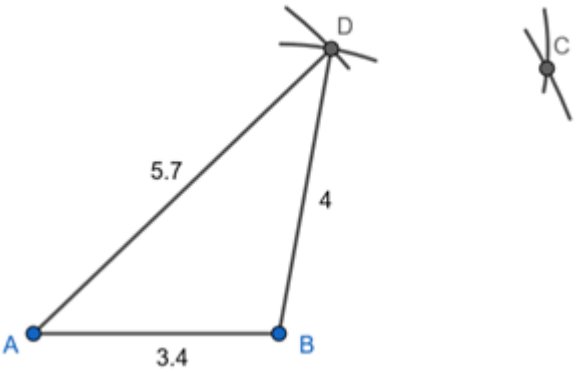
Step 4 : Join AD and BD.



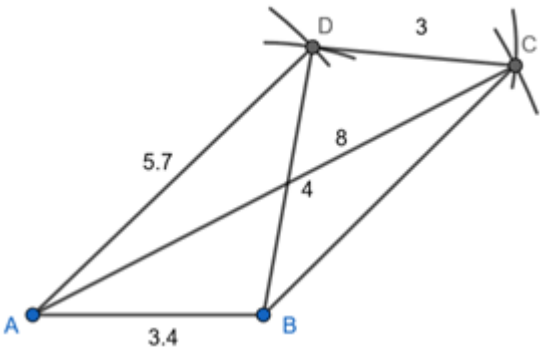
Step 5 : Taking A as centre draw an arc of radius 8 cm.



Step 6 : Taking D as centre draw arc of radius 3 cm, which cuts the arc drawn in step 5. Point of intersection of two arcs is C.



Step 7 : Join CD , AC and BC.



ABCD is the required quadrilateral.

7. Question

Construct a quadrilateral ABCD in which AB=BD=3.5cm, AD=CD=5.2 and ∠ABC=120^o

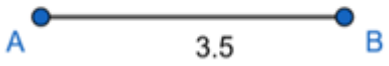
Answer

Given :

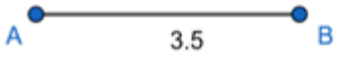
AB = BD = 3.5 cm , AD = CD = 5.2 cm , $\angle ABC = 120°$

Construction :

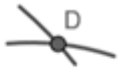
Step 1 : Draw segment AB of length 3.5 cm.

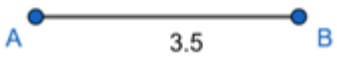


Step 2 : Taking A as centre draw an arc of radius 5.2 cm.

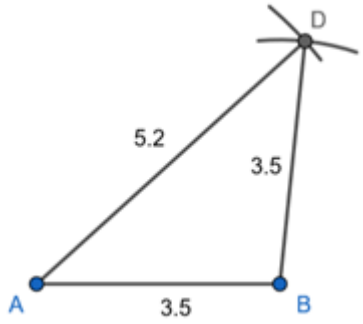


Step 3 : Taking B as centre draw an arc of radius 3.5 cm, which cuts the arc drawn in step 2. Point of intersection of two arcs is D.

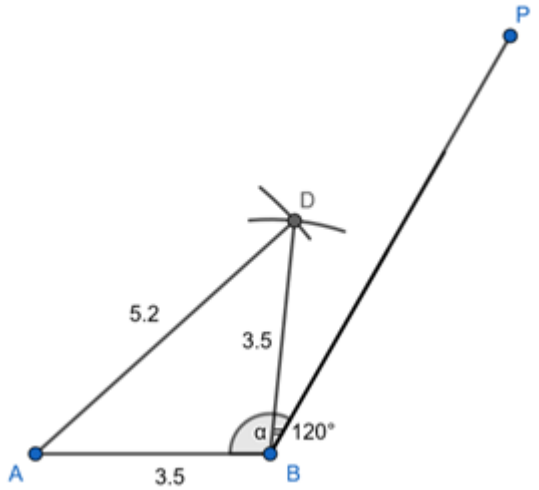




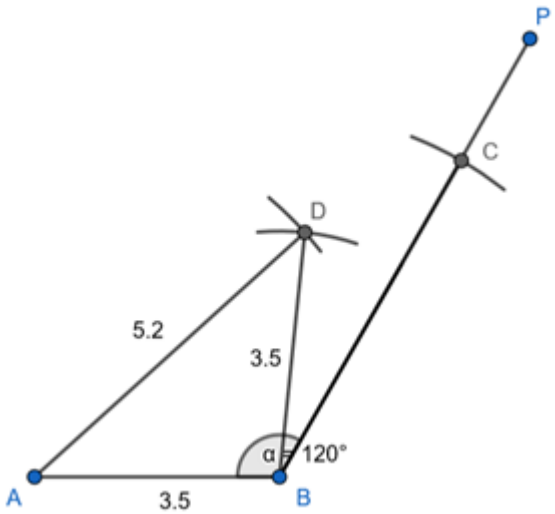
Step 4 : Join AD and BD.



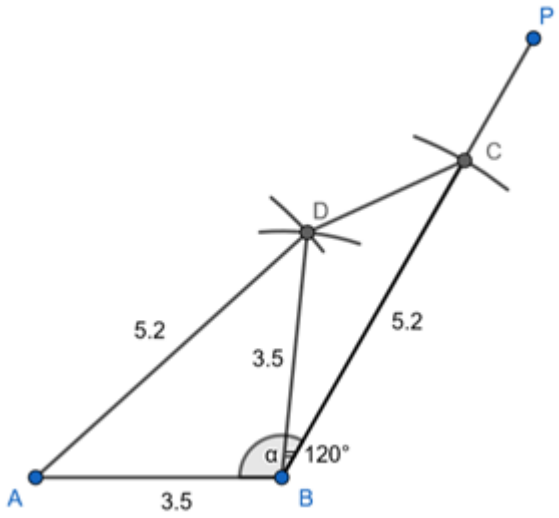
Step 5 : Draw angle ABC of 120 degrees.



Step 6 : Taking B as centre draw an arc of radius 5.2 cm, which cuts the segment BP. Point of intersection is C.



Step 7 : Join CD



ABCD is the required quadrilateral.

8. Question

Construct a quadrilateral ABCD in which AB=2.9cm, BD=3.2cm, CD=2.7cm, DA=3.4cm and ∠A = 70°.

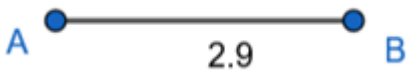
Answer

Given :

AB = 2.9 cm , AC = 3.2 cm , CD = 2.7 cm , DA = 3.4 cm , $\angle A = 70°$

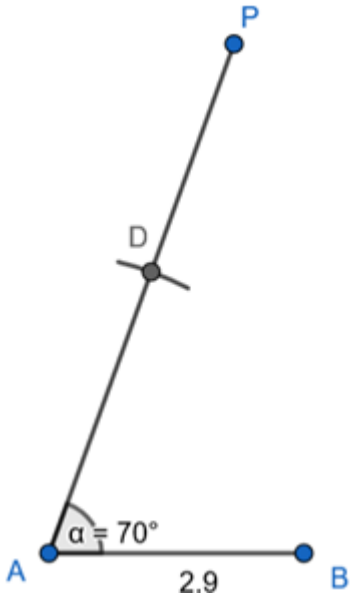
Construction :

Step 1 : Draw segment AB of length 2.9 cm.

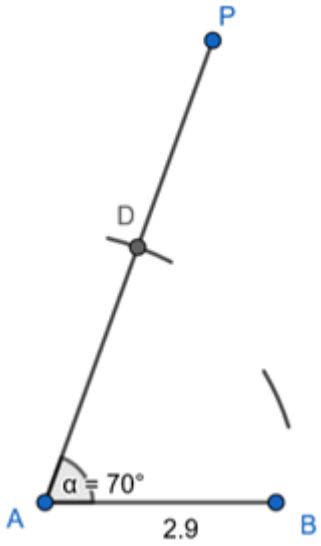


Step 2 : Draw angle A of 70 degrees.

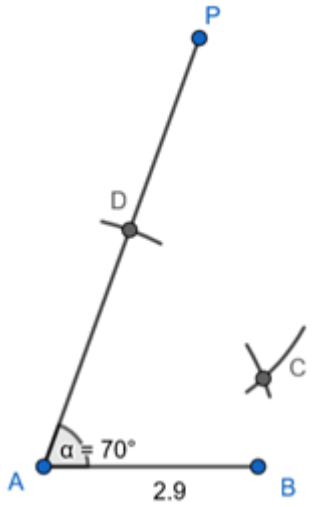
Step 3 : Taking A as centre draw an arc of radius 3.4 cm, which cuts the segment BP. Point of intersection is D.



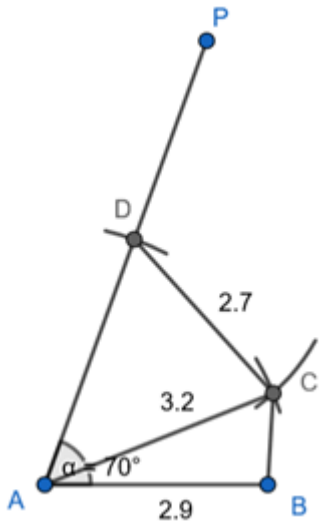
Step 4 : Taking A as centre draw an arc of radius 3.2 cm.



Step 5 : Taking D as centre draw arc of radius 2.7 cm, which cuts the arc drawn in step 4. Point of intersection is C.



Step 6 : Join CD, AC and BC.



ABCD is the required quadrilateral.

9. Question

Construct a quadrilateral ABCD in which AB=3.5cm, BC=5cm, CD=4.6cm, ∠B = 125° and ∠C = 60°.

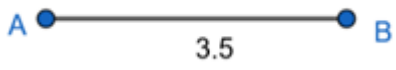
Answer

Given :

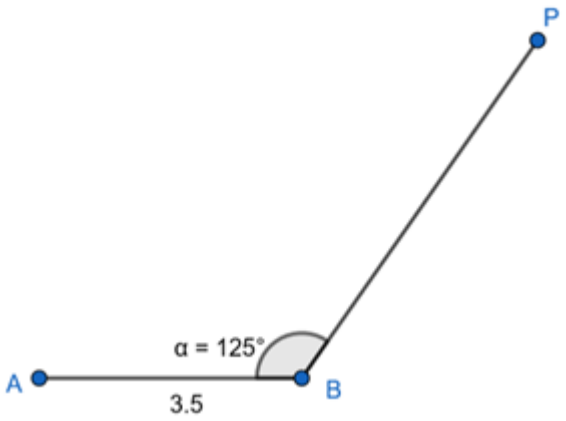
AB = 3.5 cm , BC = 5 cm , CD = 4.6 cm , $\angle B = 125°$, $\angle C = 60°$

Construction :

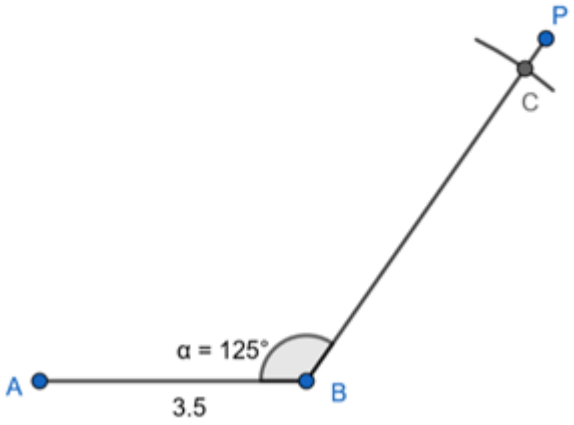
Step 1 : Draw segment AB of length 3.5 cm.



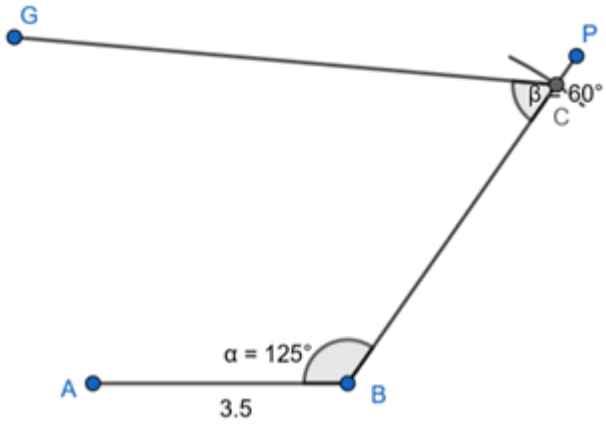
Step 2 : Draw angle B of 125 degrees.



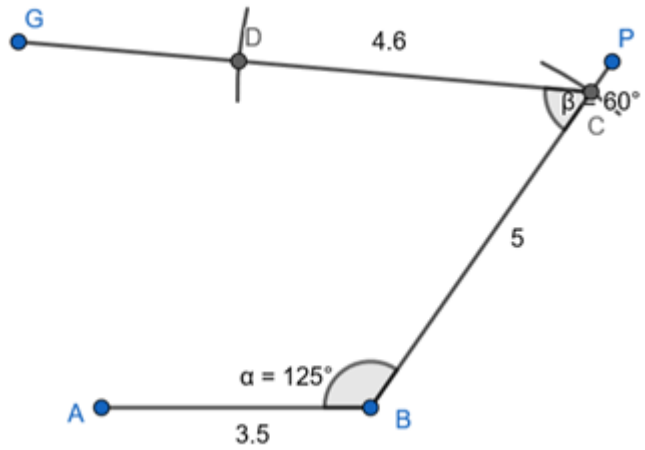
Step 3 : Taking B as centre draw arc of radius 5 cm which cuts the segment BP. Point of intersection is C.



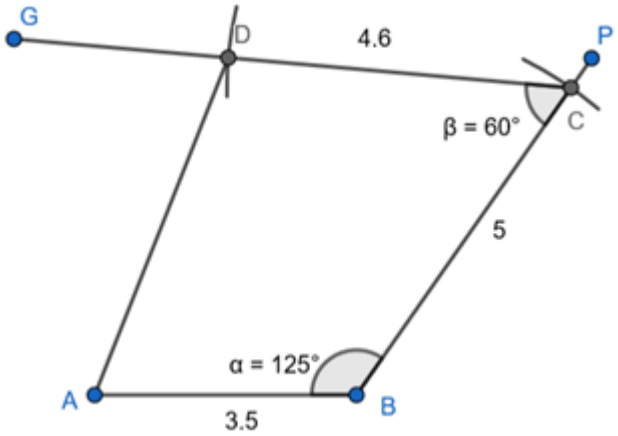
Step 4 : Draw angle C of 60 degrees.



Step 5 : Taking C as centre draw arc of radius 4.6 cm which cuts the segment CG. Point of intersection is D.



Step 6 : Join AD.



ABCD is the required quadrilateral.

10. Question

Construct a quadrilateral PQRS in which PQ=6cm, QR=5.6cm, RS=2.7cm, ∠Q = 45° and ∠R = 90°.

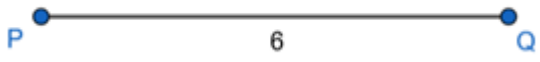
Answer

Given :

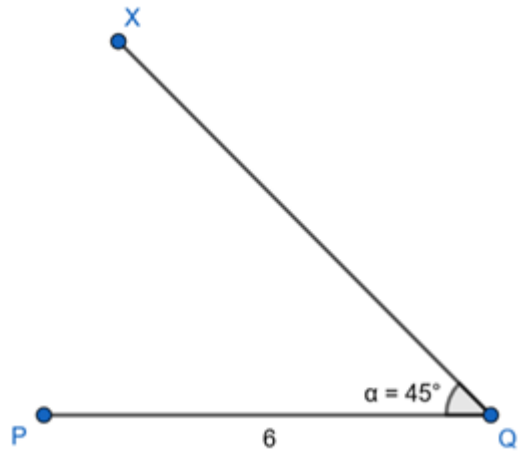
PQ = 6 cm , QR = 5.6 cm , RS = 2.7 cm , $\angle Q = 45°$, $\angle R = 90°$

Construction :

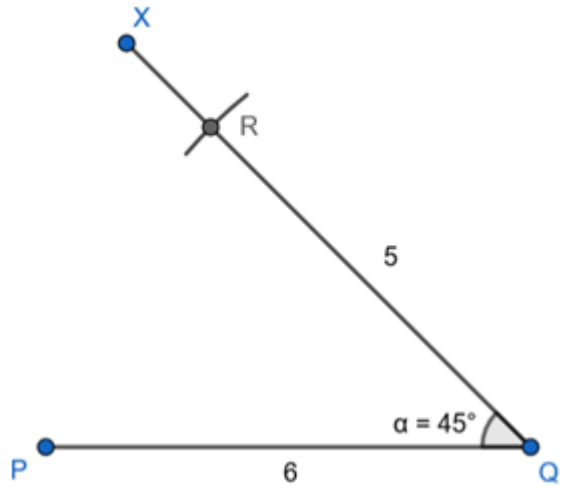
Step 1 : Draw segment PQ of length 6 cm.



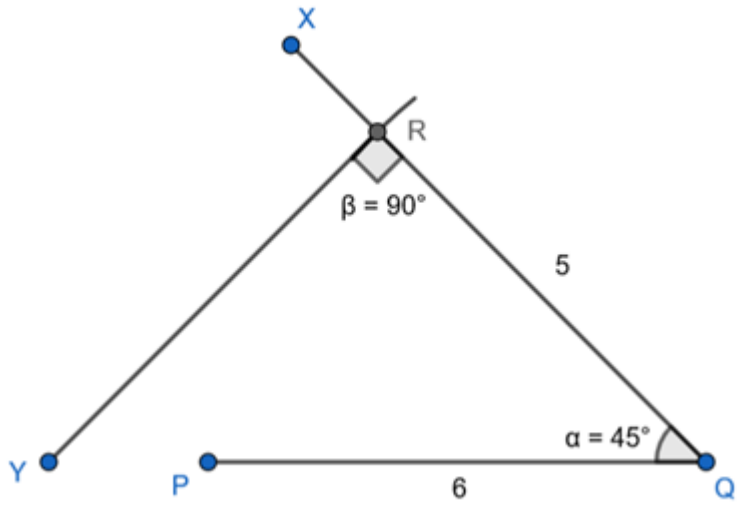
Step 2 : Draw angle Q of 45 degrees.



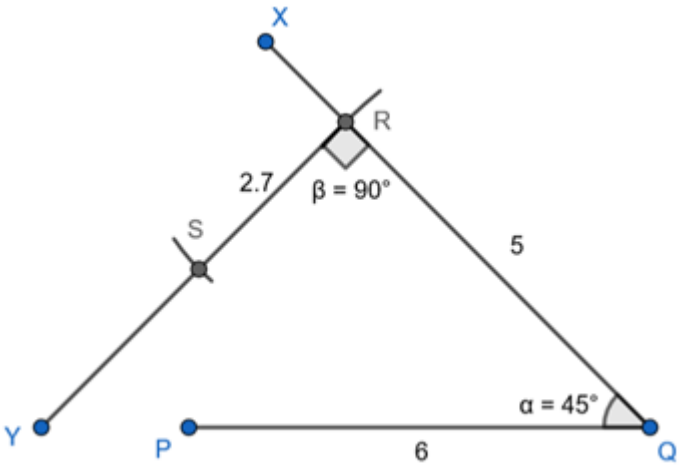
Step 3 : Taking Q as centre draw arc of radius 5.6 cm which cuts the segment BX. Point of intersection is R.



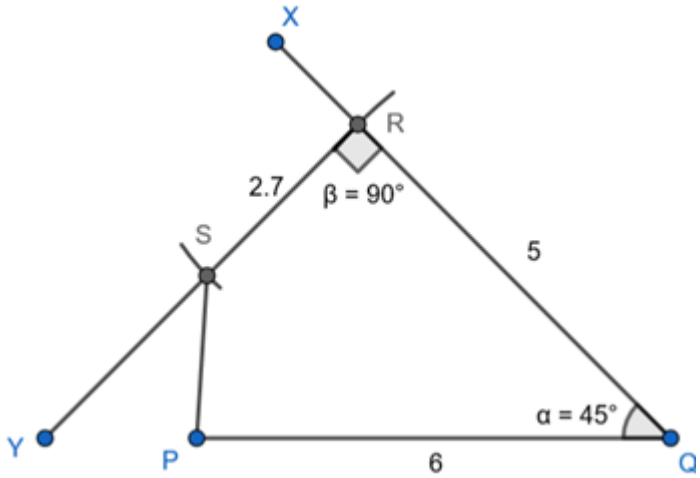
Step 4 : Draw angle R of 90 degrees.



Step 5 : Taking R as centre draw arc of radius 2.7 cm which cuts the segment RY. Point of intersection is S.



Step 6 : Join PS.



PQRS is the required quadrilateral.

11. Question

Construct a quadrilateral ABCD in which AB=5.6cm, BC=4cm, ∠A= 50°, ∠B = 105° and ∠D = 80°.

Answer

Sum of all the angles of a quadrilateral is 360°.

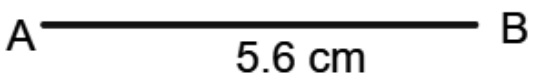
∠A + ∠B + ∠C + ∠D = 360°

50° + 105° + ∠C + 80° = 360°

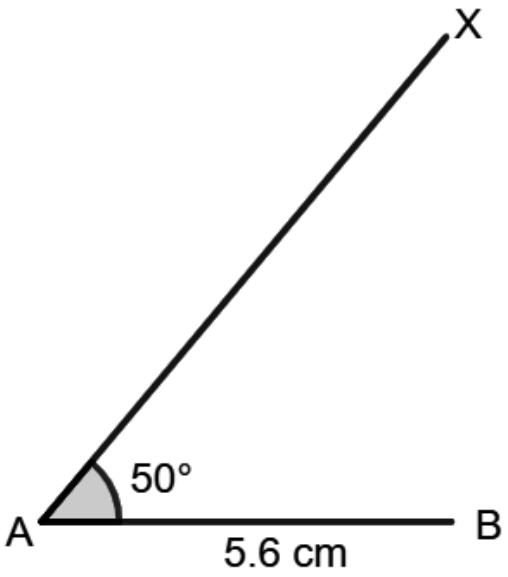
235° + ∠C = 360°∠C = 360° - 235°∠C = 125°

Construction:

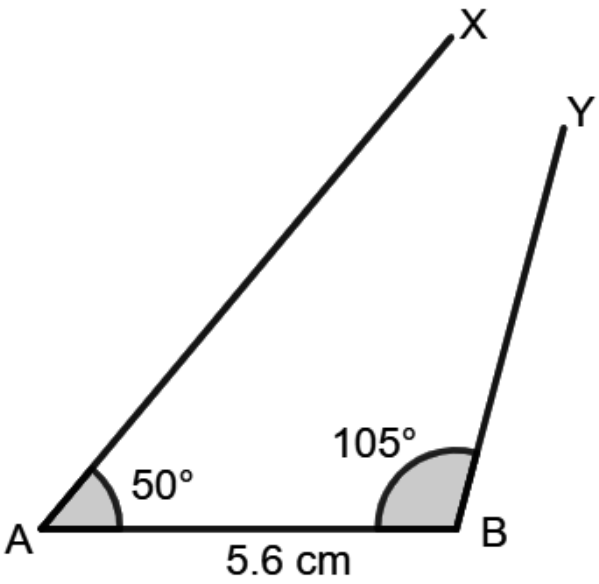
1) Draw a line AB = 5.6 cm



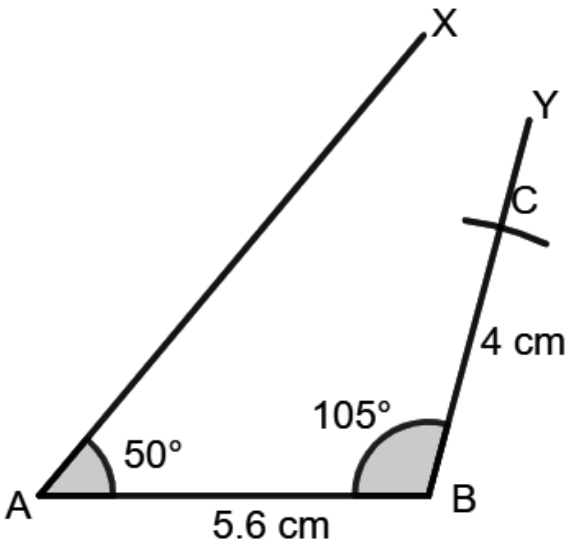
2) At point A, Draw an ∠XAB = 50° with the help of a protector.



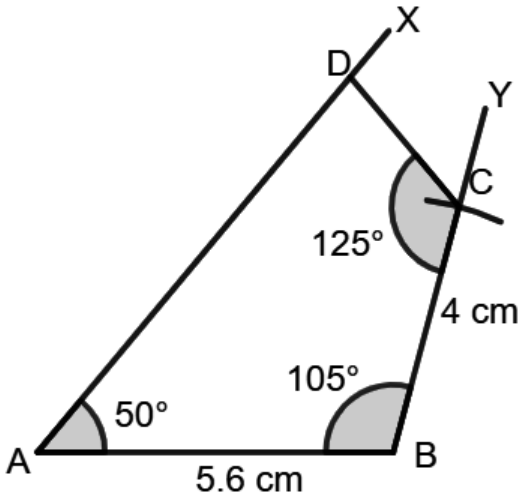
3) At point B, Draw an ∠YBA = 105° with the help of a protector.



4) With B as center, draw an arc of 4 cm which intersects the BY at C.



5) At point C, Draw ∠BCD = 125° such that D is a point on line AX.



12. Question

Construct a quadrilateral PQRS in which PQ=5cm, QR=6.5cm, ∠P = ∠R = 100° and ∠S = 75° .

Answer

Given :

PQ = 5 cm , QR = 6.5 cm , $\angle P = 100°$, $\angle R = 100°$, $\angle S = 75°$

Answer :

Sum of all angles of a quadrilateral is 360

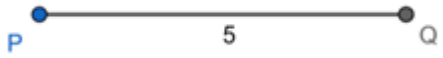
$\therefore \angle P + \angle Q + \angle R + \angle S = 360°$

$\therefore 100° + \angle Q + 100° + 75° = 360°$

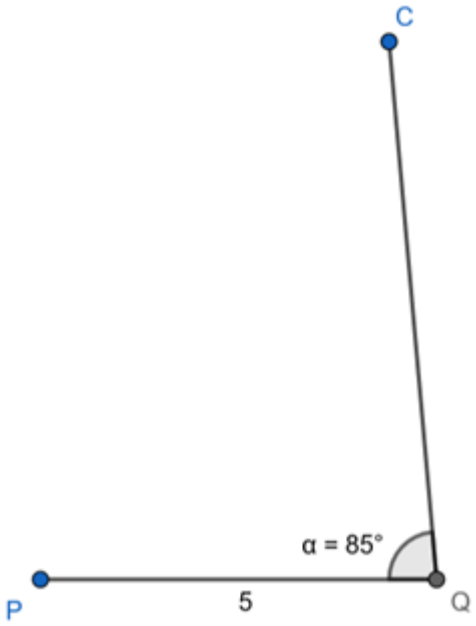
$\therefore \angle Q = 85°$

Construction :

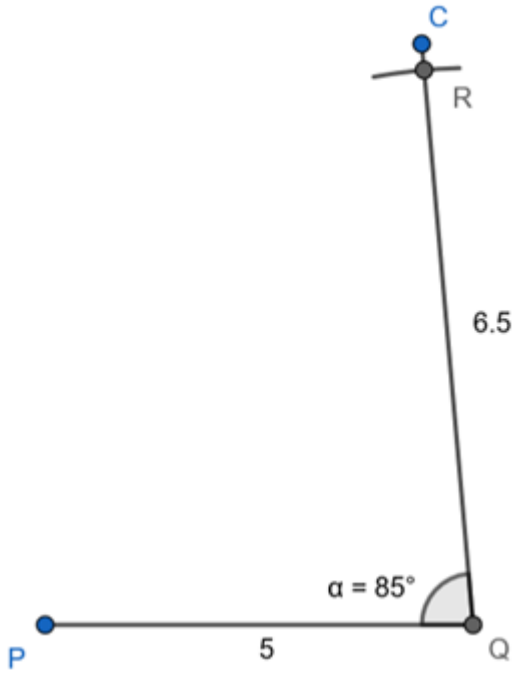
Step 1 : Draw segment PQ of length 5 cm.



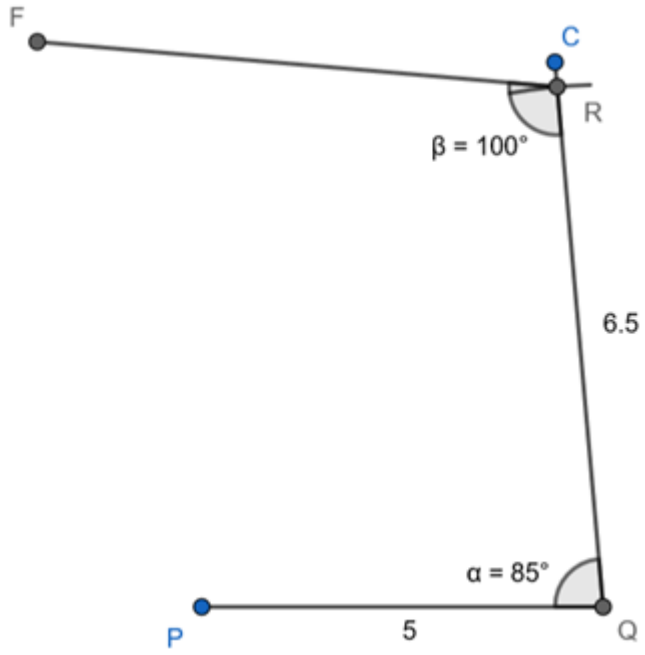
Step 2 : Draw angle PQC of 85 degrees.



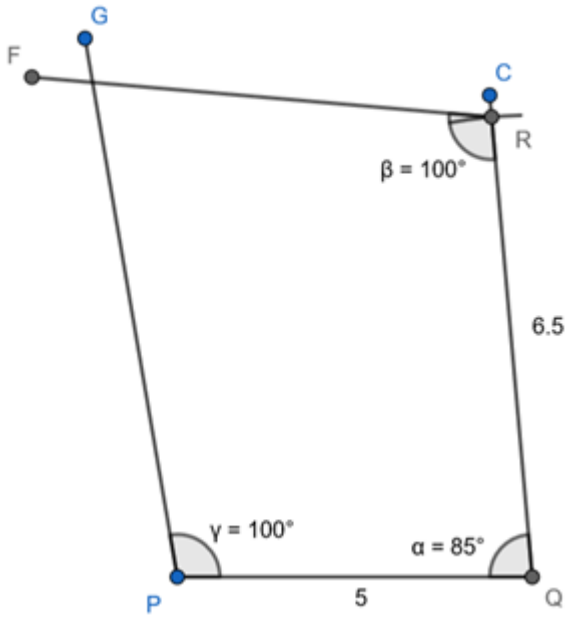
Step 3 : Taking Q as centre draw arc of radius 6.5 cm which cuts the segment QC. Point of intersection is R.



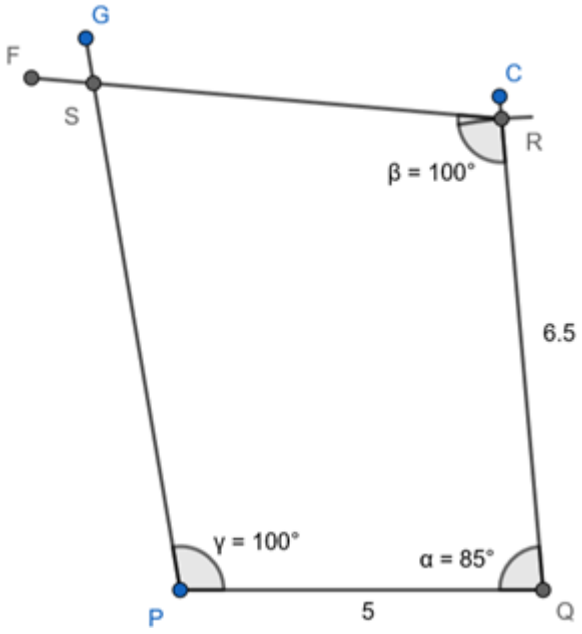
Step 4 : Draw angle QRF of 100 degrees.



Step 5 : Draw angle QPG of 100 degrees.



Step 6 : Point of intersection of segments PG and RF is S



PQRS is the required quadrilateral.

13. Question

Construct a quadrilateral ABCD in which AB=4cm, AC=5cm, AD=5.5cm and ∠ABC =∠ACD = 90°.

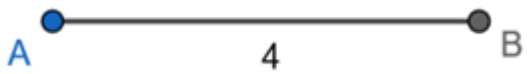
Answer

Given :

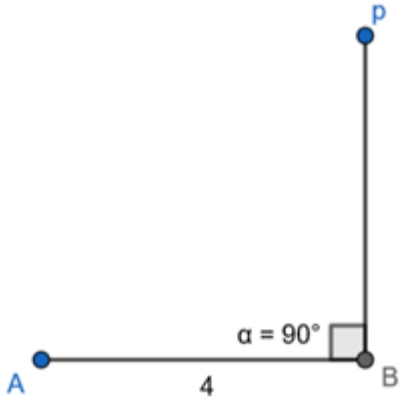
AB = 4 cm , AC = 5 cm , AC = 5.5 cm $\angle ABC = \angle ACD = 90°$.

Construction :

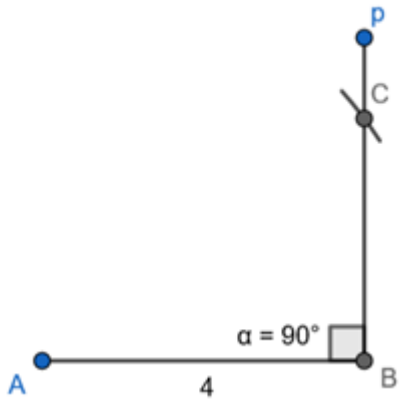
Step 1 : Draw segment AB of length 4 cm.



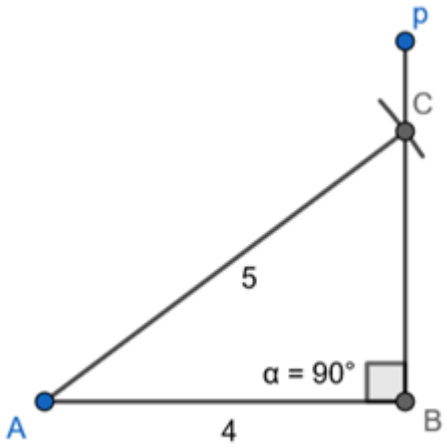
Step 2 : Draw angle ABP of 90 degrees.



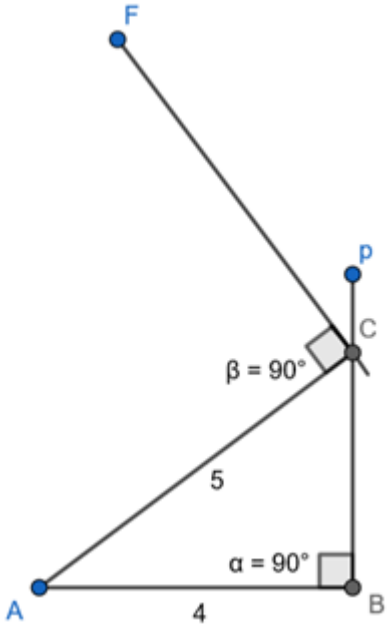
Step 3 : Taking A as centre draw arc of radius 5 cm which cuts the segment BP. Point of intersection is C.



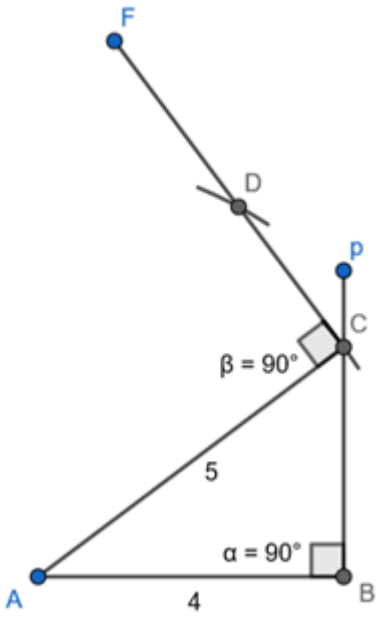
Step 4 : Join AC.



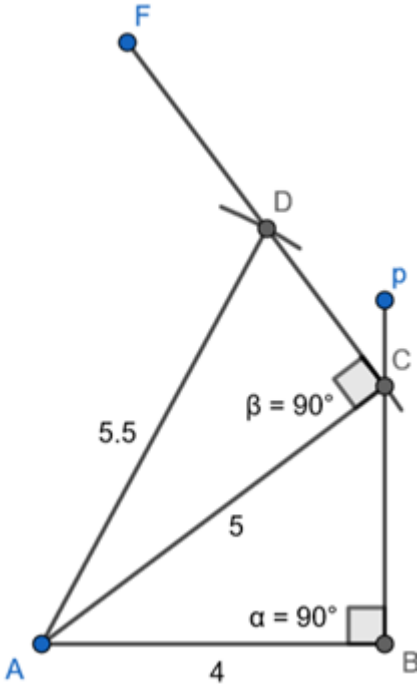
Step 5 : Draw angle ACD of 90 degrees.



Step 6 : Taking A as centre draw arc of radius 5.5 cm which cuts the segment CF. Point of intersection is D.



Step 4 : Join AD.



ABCD is the required quadrilateral.

Exercise 17B

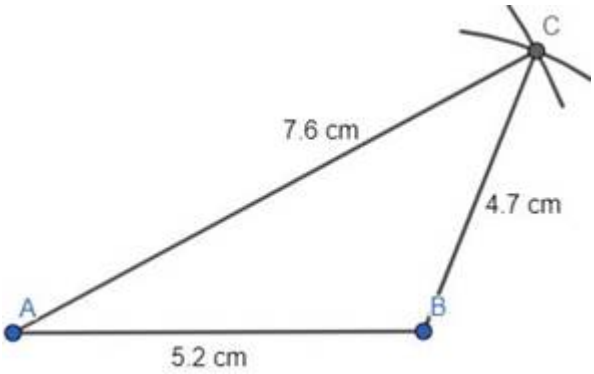
1. Question

Construct a parallelogram ABCD in which AB=5.2cm, BC=4.7cm and AC=7.6cm.

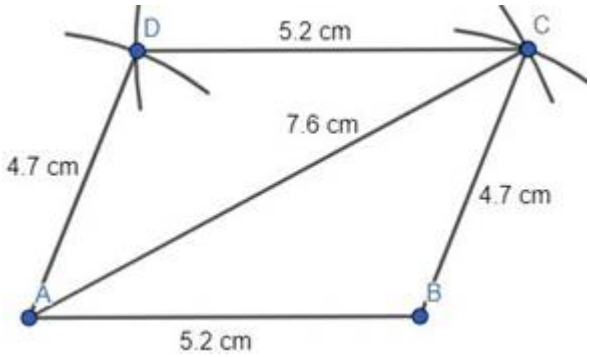
Answer

STEP 1: At first draw a base line of 5.2 cm by scale.

STEP 2: Then from point A draw an arc of radius 7.6 cm and from point B draw an arc of radius 4.7 cm with the help of compass. The intersecting point of both the arcs is C. Join AC and BC.



STEP 3: Now from point A draw an arc of radius 4.7 cm and from point C draw an arc of radius 5.2 cm with the help of compass. The intersecting point of both the arcs is D. Join AD and CD.

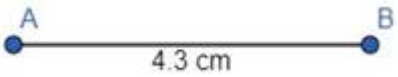


2. Question

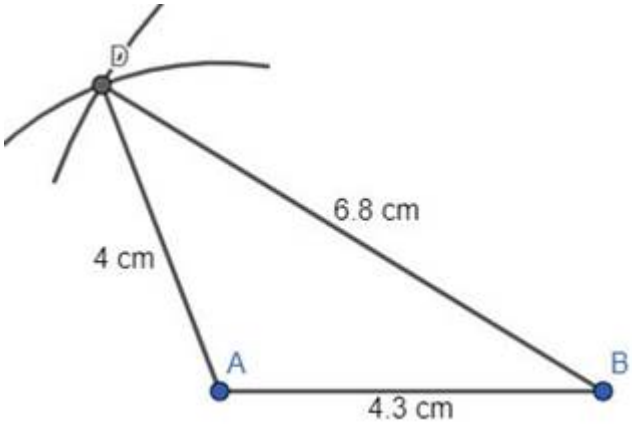
Construct a parallelogram ABCD in which AB=4.3cm, AD=4cm and BD=6.8cm.

Answer

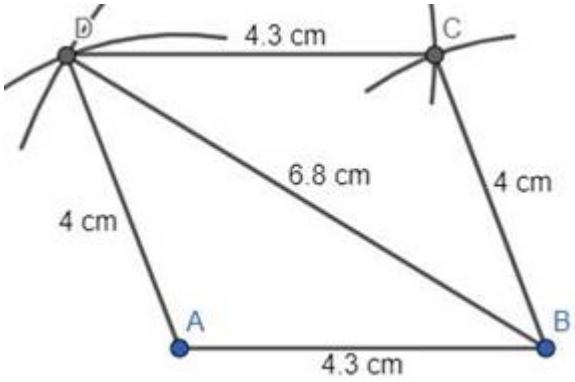
STEP 1: At first draw a base line of 4.3 cm by scale.



STEP 2: Then from point A draw an arc of radius 4 cm and from point B draw an arc of radius 6.8 cm with the help of compass. The intersecting point of both the arcs is D. Join AD and BD.



STEP 3: Now, from point D draw an arc of radius 4.3 cm and from point B draw an arc of radius 4 cm with the help of compass. The intersecting point of both the arcs is C. Join BC and DC.

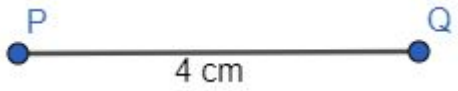


3. Question

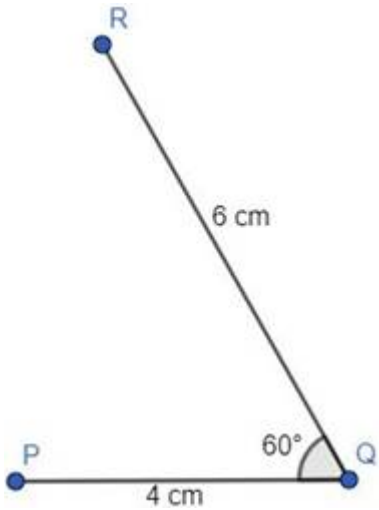
Construct a parallelogram PQRS in which QR=6cm, PQ=4cm and ∠PQR = 60°.

Answer

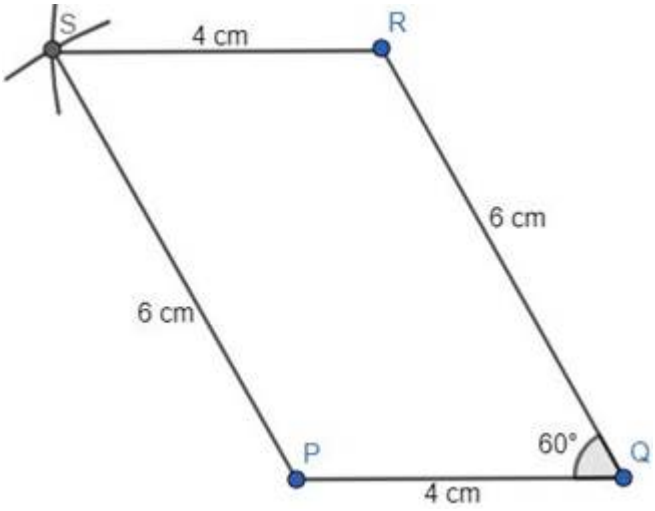
STEP 1: At first draw a base line of 4 cm by scale.



STEP 2: Then draw a 6 cm line from Q at an angle of 60^0 with the help of protractor. That point is R.



STEP 3: Now, from point P draw an arc of radius 6 cm and from point R draw an arc of radius 4 cm with the help of compass. The intersecting point of both the arcs is S. Join PS and RS.

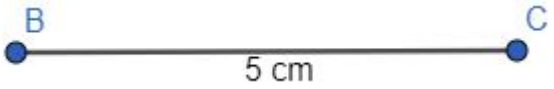


4. Question

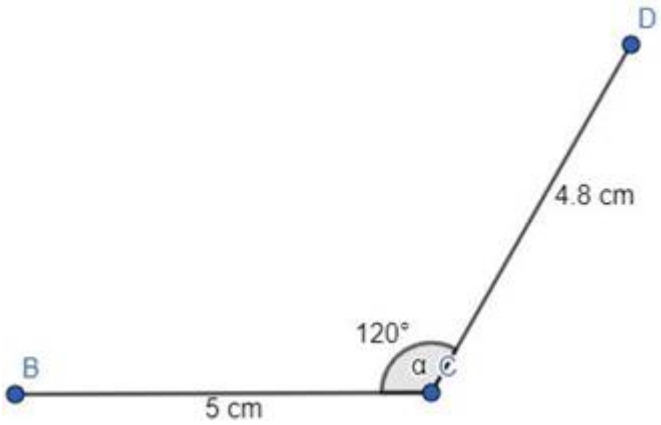
Construct a parallelogram ABCD in which BC=5cm, ∠BCD = 120° and CD=4.8cm.

Answer

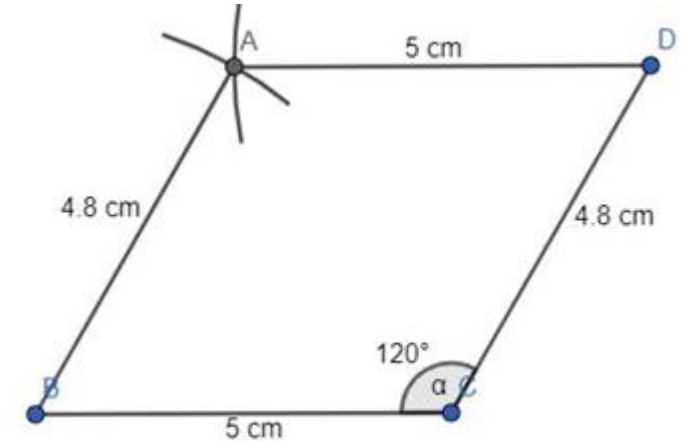
STEP 1: At first draw a base line of 5 cm by scale.



STEP 2: Then draw a 4.8 cm line from C at an angle of 120^0 with the help of protractor. That point is D.



STEP 3: Now, from point B draw an arc of radius 4.8 cm and from point D draw an arc of radius 5 cm with the help of compass. The intersecting point of both the arcs is A. Join BA and DA.

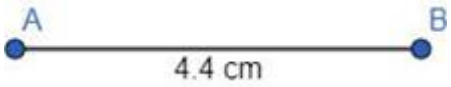


5. Question

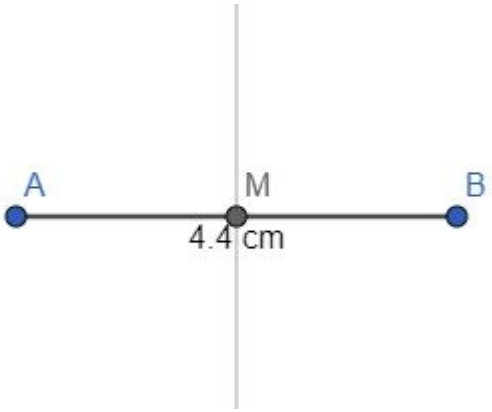
Construct a parallelogram, one of whose sides are 4.4 cm and whose diagonal are 5.6 cm and 7 cm. Measure the other side.

Answer

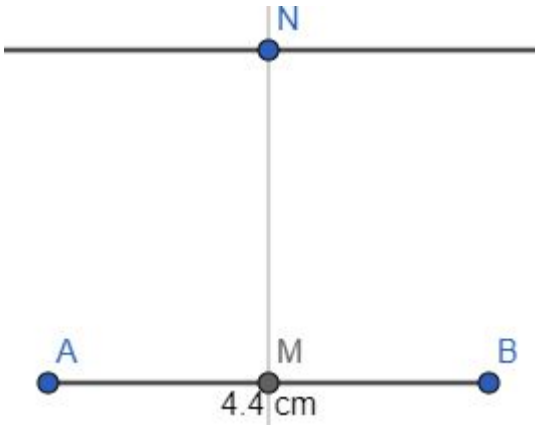
STEP 1: At first draw a base line of 4.4 cm by scale.



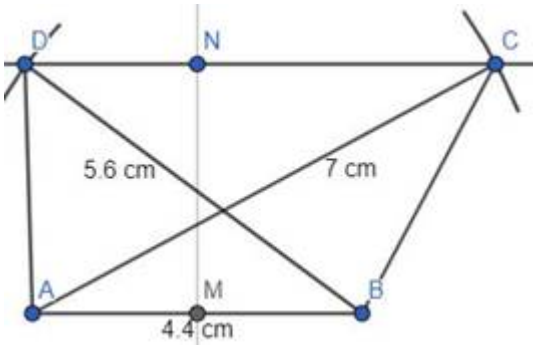
STEP 2: From any point of AB, let it be M, draw a perpendicular to AB by protractor.



STEP 3: Then from any point of the perpendicular line, let N draw another perpendicular line to this line i.e., parallel to AB by protractor.



STEP 4: Now, from A draw an arc of radius 5.6 cm on the 2nd perpendicular at point C and from B draw an arc of radius 7 cm on the 2nd perpendicular at point D with the help of compass. Join AD and BC.



ABCD is the required parallelogram.

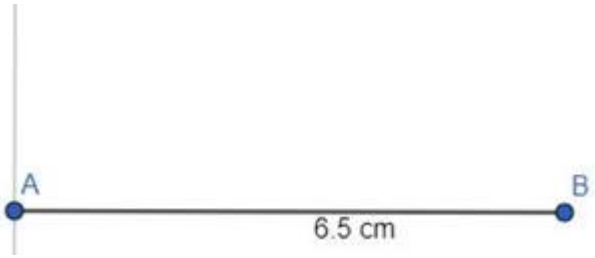
6. Question

Construct a parallelogram ABCD in which AB=6.5cm, AC=3.4cm and the altitude AL from A is 2.5 cm. Draw the altitude from C and measure it.

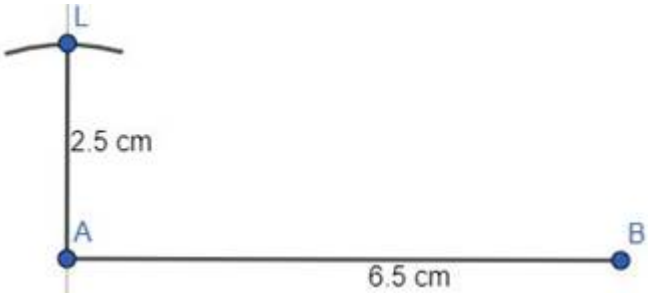
Answer

STEP 1: At first draw a base line of 6.5 cm by scale.

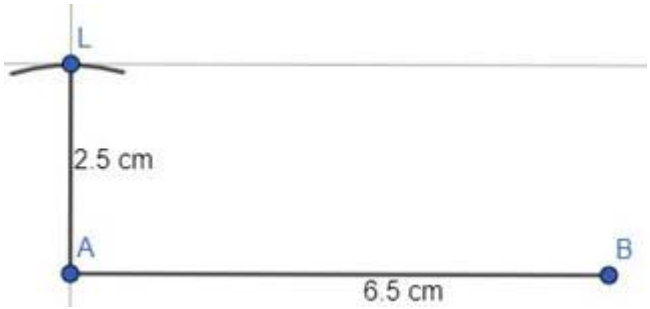
STEP 2: Then draw a line perpendicular to AB from A with the help of protractor.



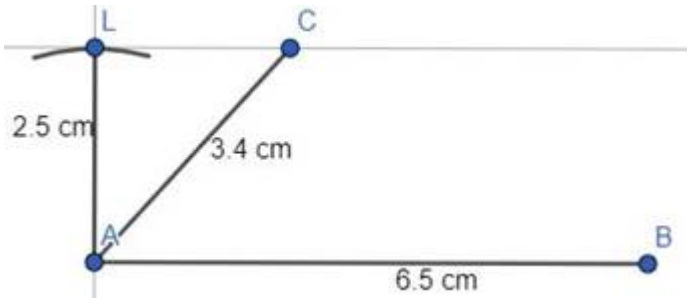
STEP 3: Then from A draw an arc of radius 2.5 cm on the perpendicular line. That intersecting point is L.



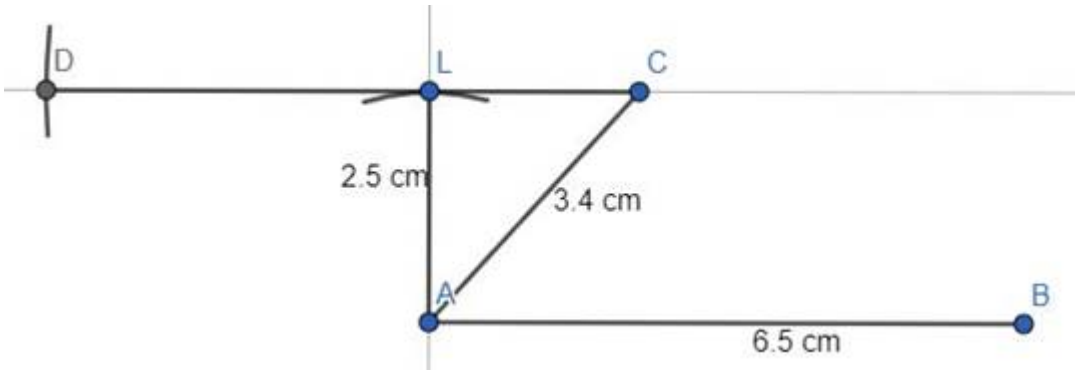
STEP 4: Then from L draw a perpendicular line with respect to AL.



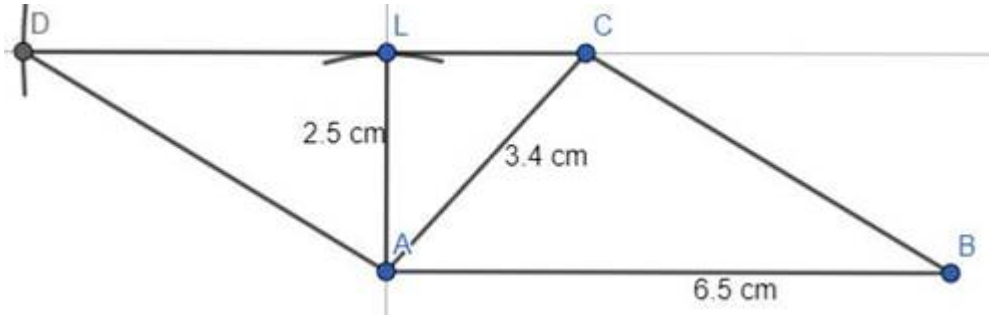
STEP 5: Now from A draw an arc of radius 3.4 cm on the new line perpendicular to AL. That point is C.



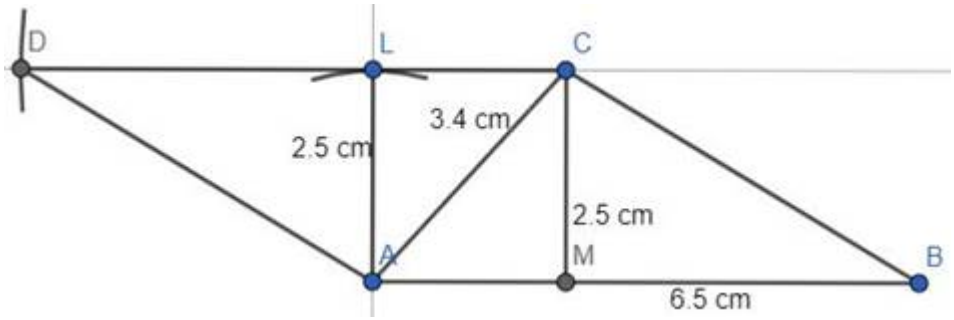
STEP 6: From C draw an arc of radius 6.5 cm on the perpendicular line CL. That intersecting point is D.



STEP 7: Join AD and BC.



According to the problem, AL = 2.5 cm which is the altitude from point A. Similarly from point C altitude is CM which is of same length of AL = 2.5 cm.



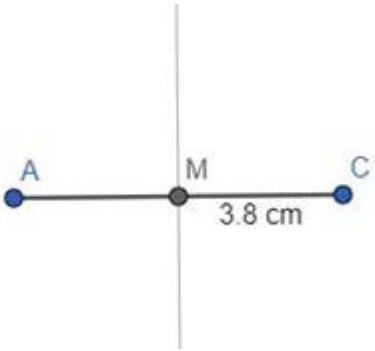
7. Question

Construct a parallelogram ABCD, in which diagonal AC=3.8cm, diagonal BD=4.6cm and the angle between AC and BC is 60°.

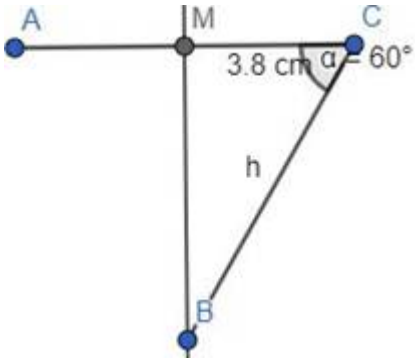
Answer

STEP 1: At first draw the diagonal AC of 3.8 cm.

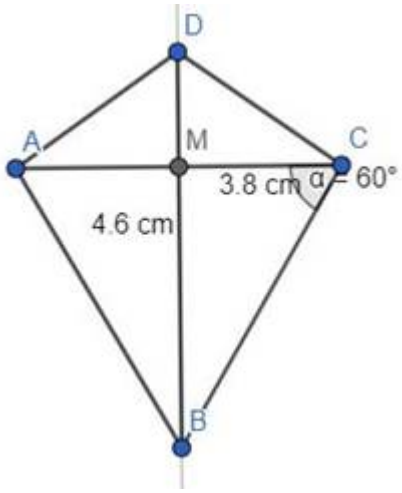
STEP 2: Now from the centre of AC (let M), draw a perpendicular line.



STEP 3: From C draw a 60^0 angle downward with the help of protractor. The intersection point between the line and the perpendicular is B.



STEP 4: From B draw an arc of radius 4.6 cm on the perpendicular line. The intersecting point is D. Join AD, CD and AB.

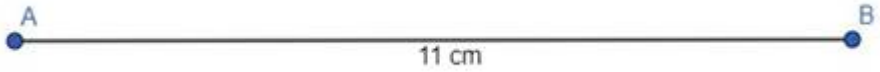


8. Question

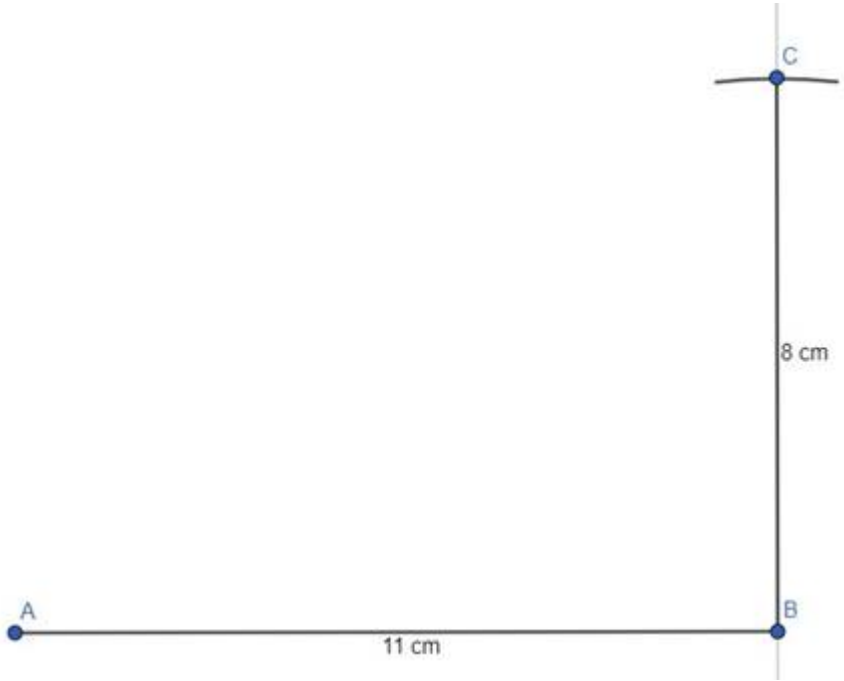
Construct a rectangle ABCD whose adjacent sides are 11 cm and 8.5 cm.

Answer

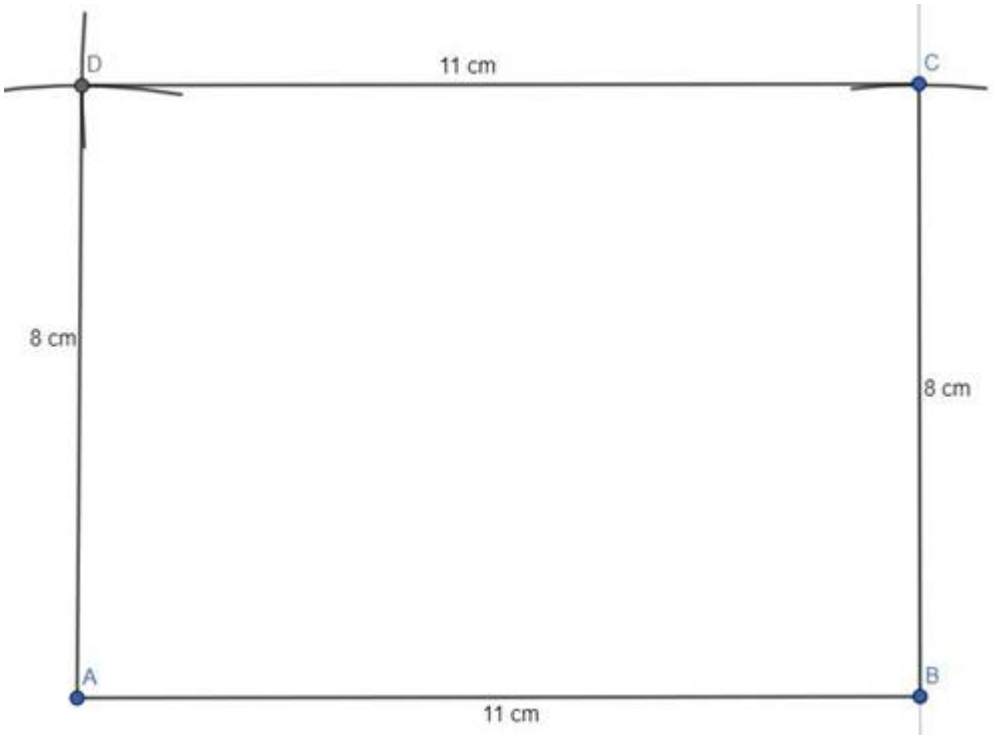
STEP 1: At first draw a base line of 11 cm by scale.



STEP 2: Then draw a line perpendicular to AB from point B. And cut an arc of radius 8 cm from B. The intersection point is C.



STEP 3: Now from A draw an arc of radius 8.5 cm and from C draw an arc of radius 11 cm intersecting at same point. That point is D. Join AD and CD.

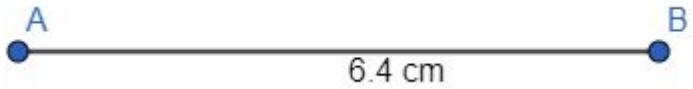


9. Question

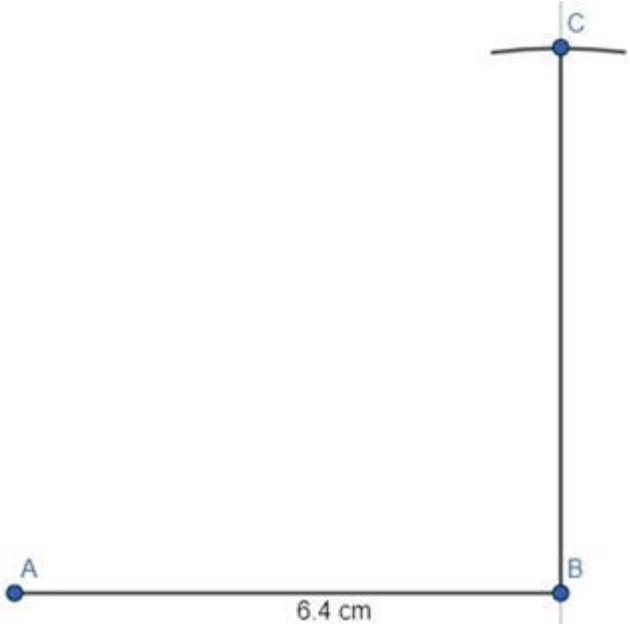
Construct a square, each of whose sides measures 6.4 cm.

Answer

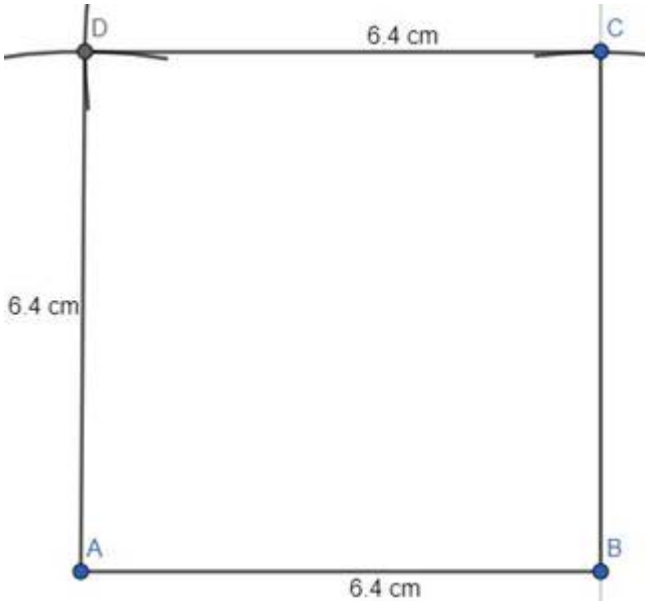
STEP 1: At first draw a base line of 6.4 cm by scale.



STEP 2: Then draw a line perpendicular to AB from point B. And cut an arc of radius 6.4 cm from B. The intersection point is C.



STEP 3: Now, from A draw an arc of radius 6.4 cm and from C draw an arc of radius 6.4 cm intersecting at same point. That point is D. Join AD and CD.

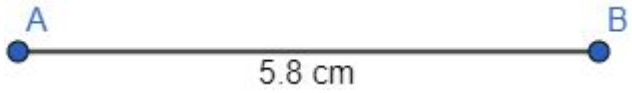


10. Question

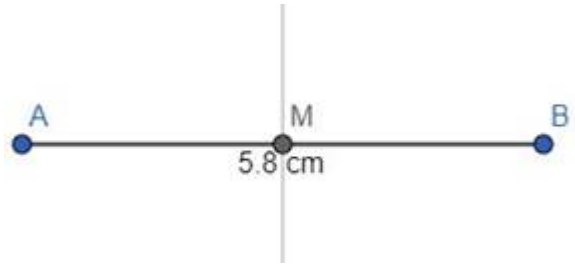
Construct a square, each of whose diagonals measures 5.8 cm.

Answer

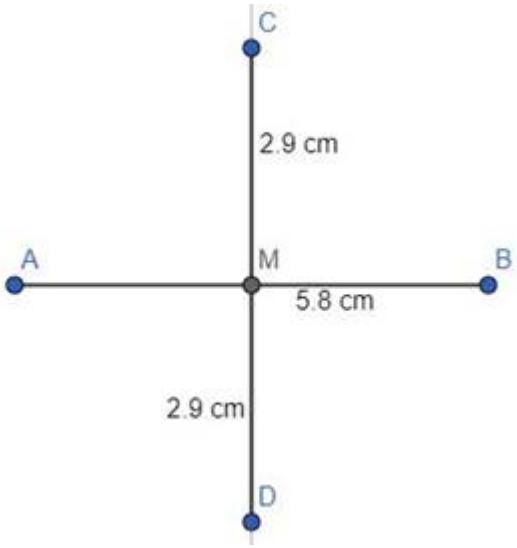
STEP 1: At first draw a diagonal of 5.8 cm by scale.



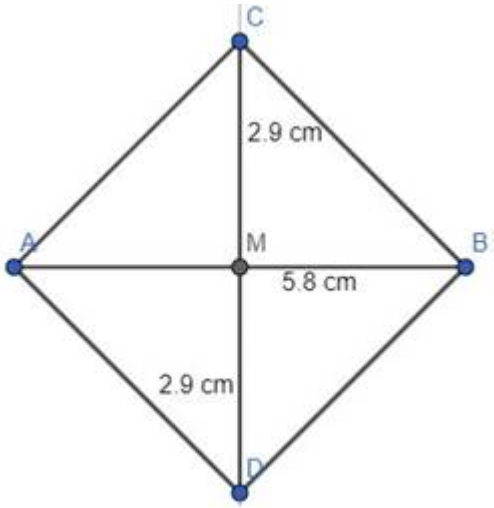
STEP 2: Then draw a perpendicular bisector of AB. Let, centre of AB is M.



STEP 3: Then draw arcs of radius 2.9 cm from M on both the sides of the perpendicular line.



STEP 4: Join AD, DB, BC and CA.



Here ADBC is the square.

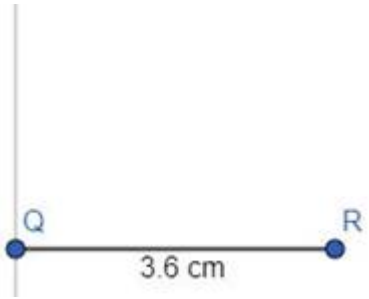
11. Question

Construct a rectangle PQRS in which $QR = 3.6$ cm and diagonal $PR = 6$ cm. Measure the other side of the rectangle.

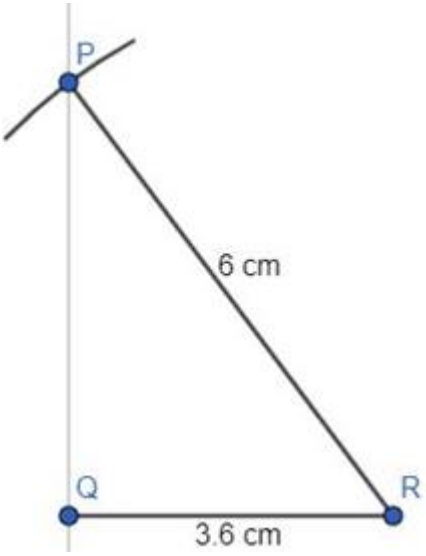
Answer

STEP 1: At first draw a base line of 3.6 cm.

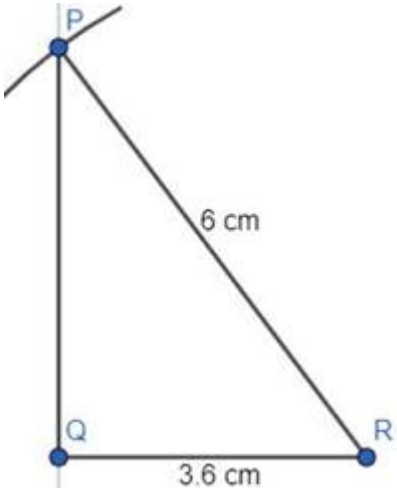
STEP 2: Draw a perpendicular line to QR from Q.



STEP 3: Now from R draw an arc of radius 6 cm on the perpendicular line by compass. The intersecting point is P.

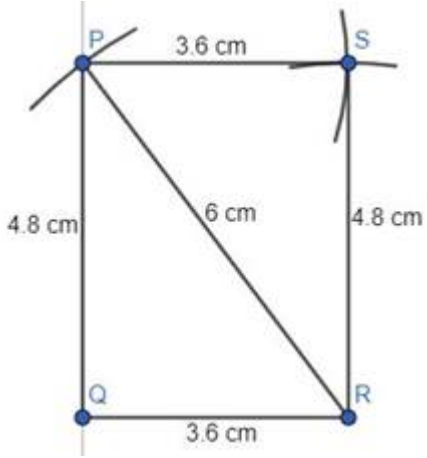


STEP 4: Join PQ. This is the other side of the rectangle. Measure its size with scale.



By measuring the length of PQ by scale, we get, PQ = 4.8 cm.

STEP 5: Draw an arc of radius 3.6 cm from P and draw an arc of radius 4.8 cm from R, intersecting at a same point. This point is S. Join PS and RS.



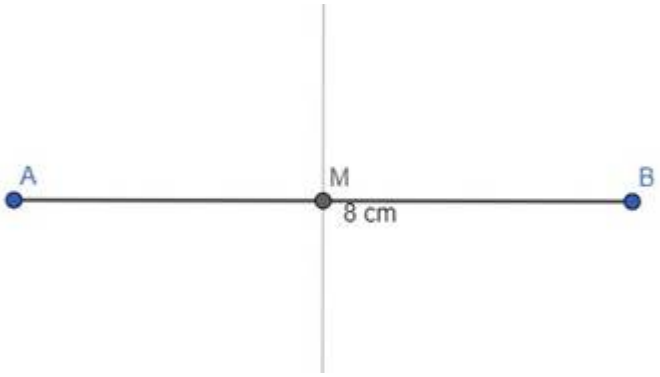
12. Question

Construct a rhombus the lengths of whose diagonals are 6 cm and 8 cm.

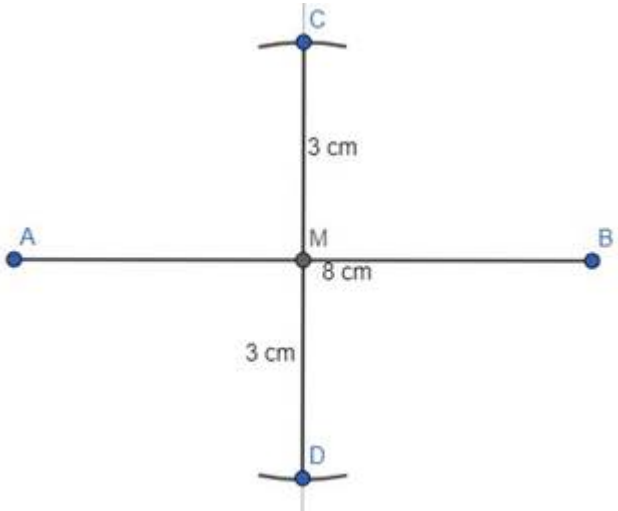
Answer

STEP 1: At first draw a base line of 8 cm.

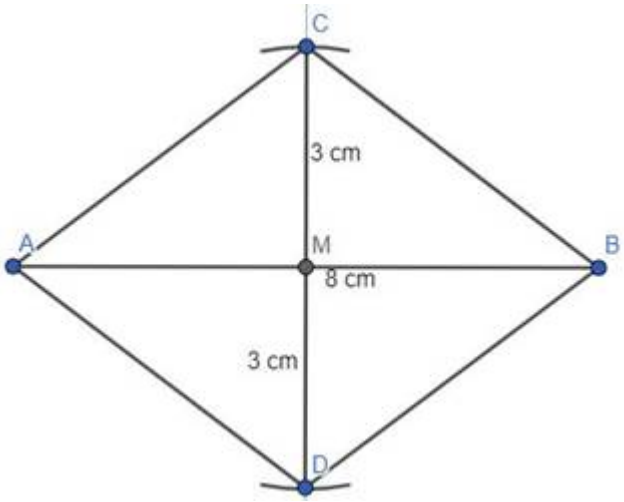
STEP 2: Draw a perpendicular bisector of AB. Let, M be the centre of AB.



STEP 3: Then draw arcs of radius 3 cm from M on both the sides of the perpendicular line with the help of compass.



STEP 4: Join AD, DB, BC and CA.



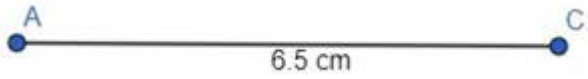
ADBC is the rhombus.

13. Question

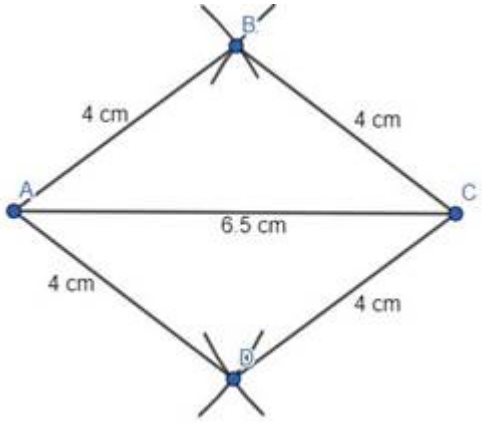
Construct a rhombus ABCD in which AB=4cm and diagonal AC is 6.5 cm.

Answer

STEP 1: At first draw diagonal of 6.5 cm.



STEP 2: Then from both the points A and C draw arc of radius 4 cm intersecting at same points, both the sides. Join the two intersecting points from A and C.



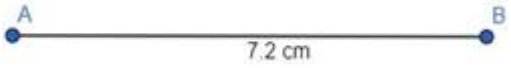
ABCD is the rhombus.

14. Question

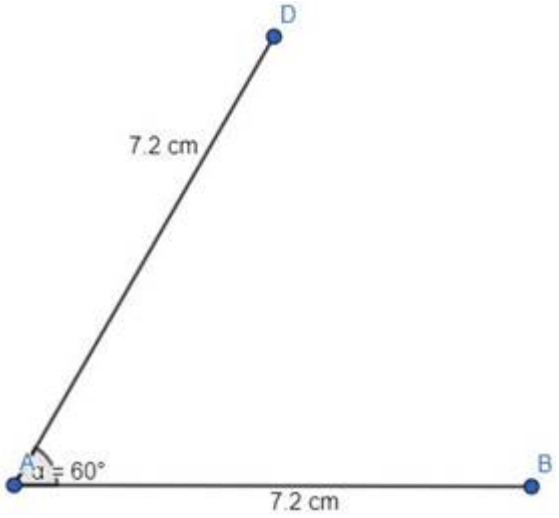
Draw a rhombus whose side is 7.2 cm and one angle is 60°.

Answer

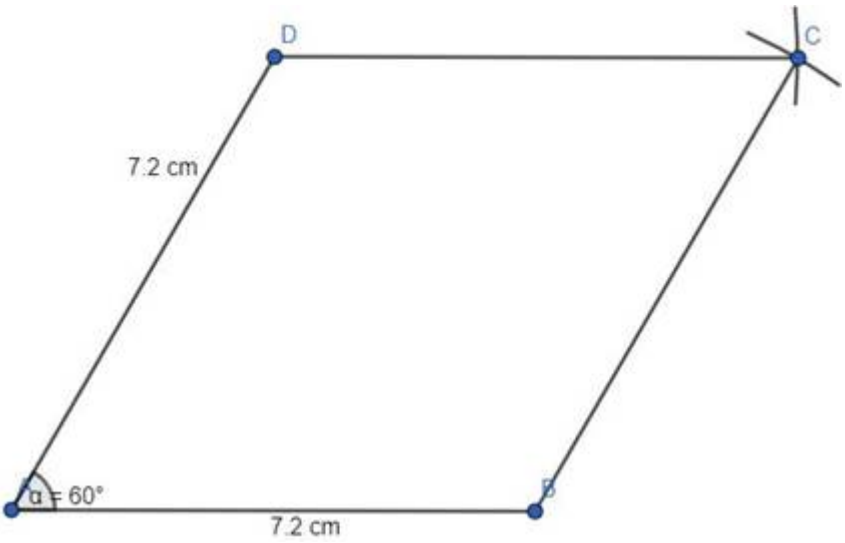
STEP 1: At first draw a base line of 7.2 cm.



STEP 2: Draw a 7.2 cm straight line from A at an angle of 60^0 with the help of protractor and scale.



STEP 3: Now from D and B both the points, draw arcs of radius of 7.2 cm, intersecting at a same point. That point is C. Join BC and DC.



This is the rhombus ABCD.

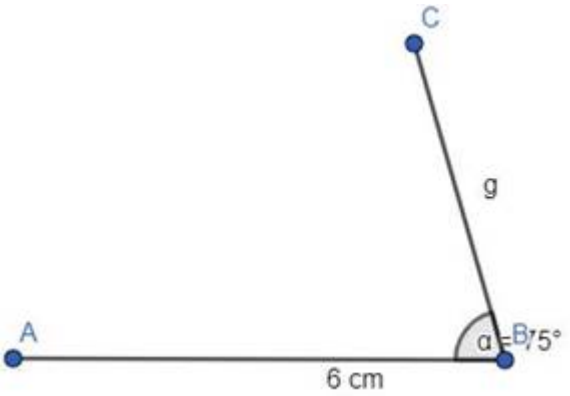
15. Question

Construct a trapezium ABCD in which AB=6cm, BC=4cm, CD=3.2cm, ∠B = 75° and DC||AB.

Answer

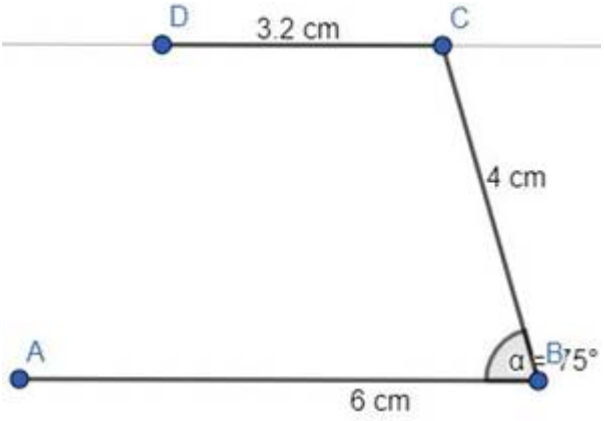
STEP 1: At first draw a base line of 6 cm by scale.

STEP 2: Then draw a 4 cm straight line from B at an angle of 75^0 by protractor and scale. That point is C

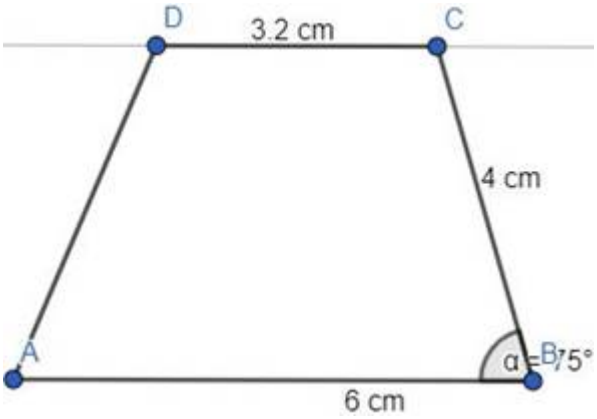


STEP 3: Now draw a line parallel to AB from C.

Draw an arc of radius of 3.2 cm from point C on the straight line.



STEP 4: Join AD.



This is the trapezium ABCD.

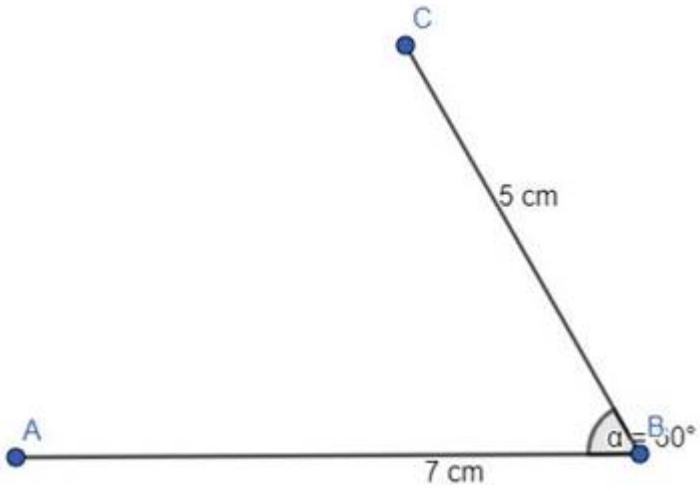
16. Question

Draw a trapezium ABCD in which AB||DC, AB=7cm, BC=5cm, AD=6.5cm and ∠B = 60°.

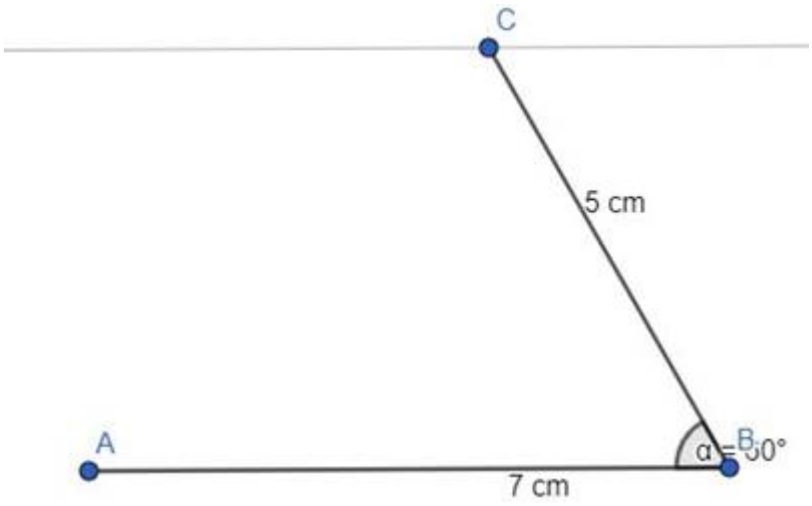
Answer

STEP 1: At first draw a base line of 7 cm.

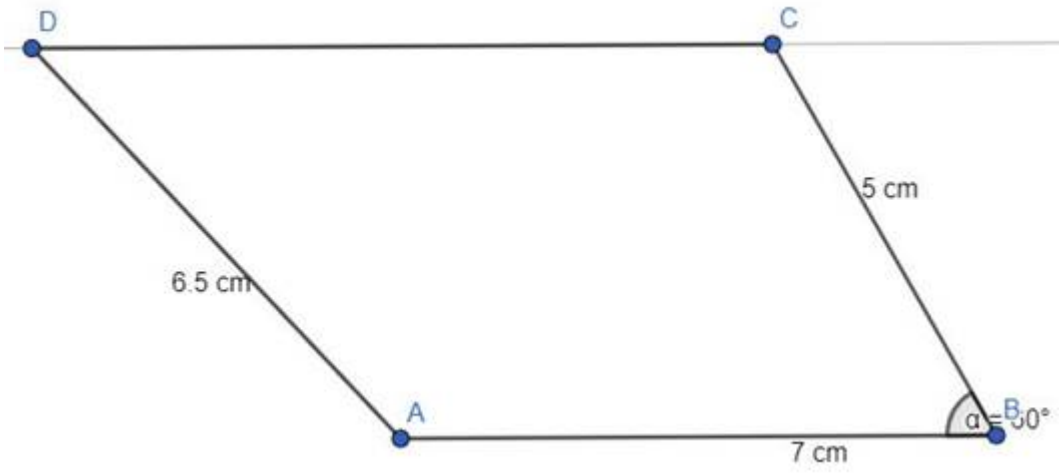
STEP 2: Then from B draw a 5 cm straight line at an angle of 60^0 by protractor and scale. That point is C.



STEP 3: Now draw a line parallel to AB from C.



STEP 4: Cut 6.5 cm from point A on the straight line parallel to AB. That point is D. Join AD.



This is the trapezium ABCD.

CCE Test Paper-17

1. Question

Define the terms:

i. Open curve

ii. Closed curve

iii. Simple closed curve

Answer

(i) Open Curve – Curves whose beginning and end points are different are called as Open Curve.

Begin Point

End Point

(ii) Closed Curve – Curves whose beginning and end points are same but crosses itself are called as Closed Curve.

(iii) Simple Closed Curve – Curves whose beginning and end points are same and does not cross itself are called as Simple Closed Curve.

2. Question

The angels of a quadrilateral are in the ration 1:2:3:4. Find the measure of each angle.

Answer

$36^o, 72^o, 108^o, 144^o$

Let x be the common multiple.

As per question,

$\angle A = x$

$\angle B = 2x$

$\angle C = 3x$

$\angle D = 4x$

As we know that, Sum of all four angles of quadrilateral is 360^o.

$\angle A + \angle B + \angle C + \angle D = 360°$

$x + 2x + 3x + 4x = 360°$

$10x = 360°$

$X= 360/10$

$= 36°$

$\angle A = 1 X 36° = 36°$

$\angle B = 2 X 36° = 72°$

$\angle C = 3 X 36° = 108°$

$\angle D = 4 X 36° = 144°$

So, Angles of quadrilateral are 36°, 72°, 108° and 144°.

3. Question

Two adjacent angles of a parallelogram are the ration 2:3. Find the measure of each of its angles.

Answer

$\angle A = 72°, \angle B = 108°, \angle C = 72°, \angle D = 108°$

Let x be the common multiple.

As per question,

$\angle A = 2x$

$\angle B = 3x$

$\angle C = 2x$

$\angle D = 3x$

$\angle A + \angle B = 180°$ (Adjacent angles of parallelogram is supplementary)

$2x + 3x = 180°$

$5x = 180°$

$X = 180 / 5 = 36°$

$\angle A = 2 \times 36° = 72°$

$\angle B = 3 \times 36° = 108°$

$\angle C = 2 \times 36° = 72°$

$\angle D = 3 \times 36° = 108°$

So, Angles of quadrilateral are 72°, 108°, 72° and 108°.

4. Question

The sides of rectangle are in the ration 4:5 and its perimeter is 180 cm. Find its sides.

Answer

40 cm, 50 cm

Let x be the common multiple.

As per question,

Length = 4x

Width = 5x

As per formula,

Perimeter = 2× (l + w)

180 = 2× (4x + 5x)

180 = 18x

x = 10

So,

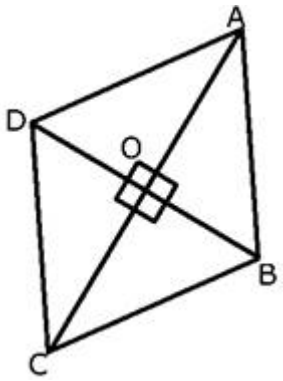
Length = 40 cm

Width = 50 cm

5. Question

Prove that the diagonals of a rhombus bisect each other at right angles.

Answer



Let ABCD be a rhombus whose diagonal AC and BD intersect at the point O.

As we know that the diagonals of a parallelogram bisect each other and rhombus is a parallelogram.

So, OA=OC and OB=OD.

From Δ COB and Δ COD we get,

CB = CD (sides of rhombus) and

CO is common in both the triangles.

So, OB = OD

Therefore, by SSS theorem.

Δ COB ≅ Δ COD

$\angle$ COB = $\angle$ COD

$\angle$ COB + $\angle$ COD = 180° (Linear pair of angles)

Thus, $\angle$ COB = $\angle$ COD = 90°

Hence, the diagonals of a rhombus bisect each other at right angles.

6. Question

The diagonals of a rhombus are 16 cm and 12 cm. Find the length of each side of the rhombus.

Answer

10 cm

Rhombus forms four congruent right triangles.

Sides of each triangle will be half of rhombus diagonals. i.e. 16/2 = 8 cm and 12/2 = 6 cm

According to Pythagoras theorem,

$a^2 = b^2 + c^2$

$a^2 = 8^2 + 6^2$

$a = \sqrt{(8^2+6^2)}$

$a = \sqrt{(64+36)}$

$a = \sqrt{10}$

a = 10 cm

So, Sides of rhombus is 10cm.

7. Question

Two opposite angles of a parallelogram are $(3x-2)^o$ and $(50-x)^o$. The measures of all its angles are

A. 97°, 83°, 97°, 83°

B. 37°, 143°, 37°, 143°

C. 76°, 104°, 76°, 104°

D. none of these

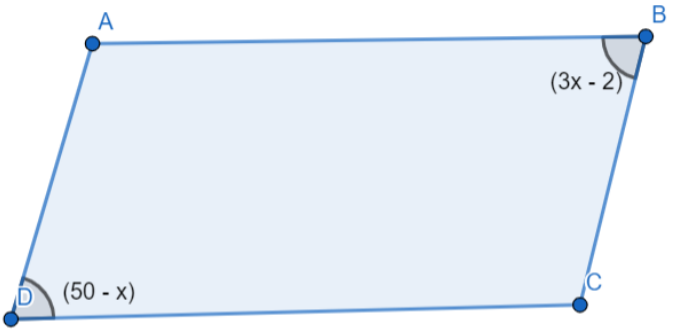
Answer

To Find:

All angles of a parallelogram

Given: Opposite angles are (3x - 2) and (50 - x)

Diagram:



Let the parallelogram be ABCD, and opposite angles be ∠B and ∠D, such that∠A = (3x - 2)∠C = (50 - x)

∠B = ∠D (Opposite angles of a parallelogram are equal)

3x - 2 = 50 - x

3x + x = 50 + 2

4x = 52°

x = 13°

Putting the value of x, we get,

∠B = 3(13) - 2 = 37°∠D = 50 - 13 = 37°Also. ∠A = ∠C

(Opposite angles of a parallelogram are equal)By angle sum property of quadrilateral,

∠A + ∠B + ∠C + ∠D = 360°

37° + ∠A + 37° + ∠C = 360°

2∠A + 74 =360°2∠A = 286°∠

A = 143°

Hence, ∠A = ∠C =143°

So, Angles of parallelogram is 37°, 143°, 37° and 143°.

8. Question

The angles of quadrilateral are in the ration 1:3:7:9. The measure of the largest angle is

A. 63°

B. 72°

C. 81°

D. none of these

Answer

Let x be the common multiple.

As per question,

$\angle A = x$

$\angle B = 3x$

$\angle C = 7x$

$\angle D = 9x$

As we know that, Sum of all four angles of quadrilateral is 360^o.

$\angle A + \angle B + \angle C + \angle D = 360°$

$x + 3x + 7x + 9x = 360°$

$20x = 360°$

$X= 360/20$

$= 18°$

$\angle A = 1 \times 18° = 18°$

$\angle B = 3 \times 18° = 54°$

$\angle C = 7 \times 18° = 126°$

$\angle D = 9 \times 18° = 162°$

So, largest angle of quadrilateral is 162°.

9. Question

The length of a rectangle is 8 cm and each of its diagonals measures 10 cm. The breadth of the rectangle is

A. 5 cm

B. 6 cm

C. 7 cm

D. 9 cm

Answer

A rectangle can be divided into two triangles.

Sides of each triangle will be 8cm and 10 cm.

According to Pythagoras theorem,

$a^2 = b^2 + c^2$

$10^2 = 8^2 + c^2$

$c = \sqrt{(10^2 - 8^2)}$

$c = \sqrt{36}$

c = 6 cm

So, breadth of rectangle is 6 cm.

10. Question

In a square PQRS, if PQ=(2x+3) and QR=(3x-5) cm then

A. x=4

B. x=5

C. x=6

D. x=8

Answer

As we know that, all sides of square are equal.

So, according to question,

2x + 3 = 3x -5

X = 8.

So, Sides of square is 8 cm.

11. Question

The bisectors of two adjacent angles of a parallelogram intersect at

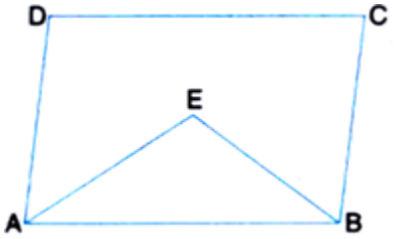
A. 30°

B. 45°

C. 60°

D. 90°

Answer



Let ABCD is a parallelogram.

The angle bisectors AE and BE of adjacent angles A and B meet at E.

AD || BC (Opposite sides of ||gm)

∠DAB + ∠CBA = 180°

2∠EAB + 2∠EBA = 180° (sum of the interior angles, formed on the same side of the transversal, is 180°)

AE and BE are the bisectors of ∠DAB and ∠CBA respectively.

∠EAB + ∠EBA = 90° ... (1)

In ΔEAB,

∠EAB + ∠EBA + ∠AEB = 180° (sum of the angles of a triangle is 180°)

90° + ∠AEB = 180°

From (1)

∠AEB = 90°

12. Question

How many diagonals are there in a hexagon?

A. 6

B. 8

C. 9

D. 10

Answer

No. of diagonals = $\frac{n(n-3)}{2}$ [n is No. of Sides]

= $\frac{6\times(6-3)}{2}$

= 9

13. Question

Each interior angle of a polygon is 135. How many sides does it have?

A. 10

B. 8

C. 6

D. 5

Answer

Interior Angle = 135

So, Exterior Angle = 180 – 135

= 45°

Sum of exterior angles of polygon is 360^o

No. of Sides = $\frac{360}{45}$

= 8

14. Question

Fill in the blanks.

For a convex polygon of n sides, we have:

i. Sum of all exterior angles = ...

ii. Sum of all interior angles = ...

iii. Number of diagonals = ...

Answer

i. 4 right angles = 360°

Convex Polygon is also a polygon and sum of all exterior angles of any polygon is 360^o

ii. (2n - 4) right angles

Convex Polygon is also a polygon and sum of all interior angles of any polygon is

(n-2)× 180°

Here, n represents the no of sides of polygon.

iii. $\frac{1}{2}n(n-3)$

No. of diagonals = $\frac{n(n-3)}{2}$ [n is No. of Sides]

15. Question

Fill in the blanks.

For a regular polygon of n sides, we have:

i. Sum of all exterior angles = ...

ii. Sum of all interior angles = ...

Answer

i. 360°

Sum of all exterior angles of any polygon is 360^o

ii. $\left\{180^\circ - \left(\frac{360}{n}\right)^\circ\right\}$

Exterior Angle = $\frac{360}{n}$ [n represents no of sides of polygon]

Interior Angle + Exterior Angle = 180^o

So, Interior Angle = $\left(180 - \frac{360}{n}\right)^\circ$

16. Question

Fill in the blanks.

i. Each interior angles of a regular octagon is $(.....)^\circ$.

ii. The sum of all interior angle of a regular hexagon is $(.....)^\circ$.

iii. Each exterior angle of a regular polygon is 60°. This polygon is a ..... .

iv. Each interior angle of a regular polygon is 108°. This polygon is a ..... .

v. A pentagon has ..... diagonals.

Answer

i. 135°

Exterior Angle = $\frac{360}{8}$ [n represents no of sides of polygon]

= 45°

Interior Angle + Exterior Angle = 180^o

Interior Angle = 180 – 45 = 135°

ii. 720°

Sum of Interior Angle = (n-2)× 180°

= (6-2) × 180 °

= 720°

iii. Hexagon

Exterior Angle = $\frac{360}{n}$

60 = $\frac{360}{n}$

N = $\frac{360}{60}$

= 6

No. of Sides is 6.

So, it is a hexagon.

iv. Pentagon

Interior Angle = 108°

Exterior Angle = 180° - 108° = 72°

No. of Sides = $\frac{360}{72}$

= 5

So, it is a pentagon.

v. 5

No. of diagonals = $\frac{n(n-3)}{2}$ [n is No. of Sides]

= $\frac{5\times(5-3)}{2}$

= 5

17. Question

Write 'T' for true and 'F' for false of each of the following:

i. The diagonals of a parallelogram are equal.

ii. The diagonals of a rectangle are perpendicular to each other.

iii. The diagonals of a rhombus bisect each other at right angles.

iv. Every rhombus is a kite.

Answer

i. F

The diagonals of square and rectangle only are equal. Rest all the parallelograms like Rhombus etc. do not have diagonals equal in size.

ii. F

Diagonals of Rectangle do not intersect in right angle hence it is not perpendicular to each other. Only in case of Square, diagonal intersects at right angle.

iii. T

In rhombus, diagonals bisect the angles and are the perpendicular bisector of each other.

iv. F

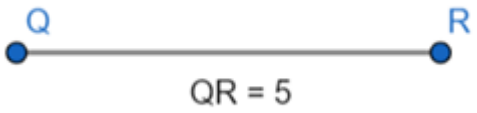
In rhombus, every side has equal length but it in kite only pair of adjacent sides are equal in length.

18. Question

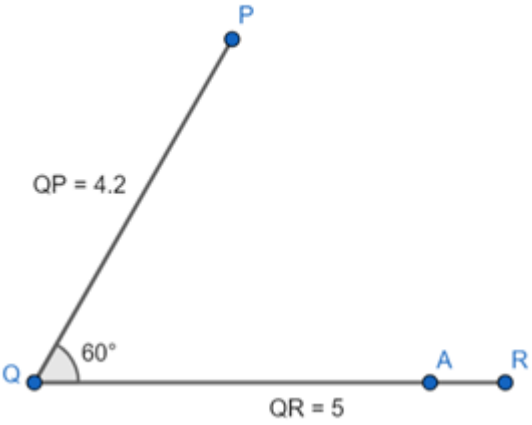
Construct a quadrilateral PQRS in which PQ = 4.2 cm, ∠PQR = 60°, ∠QPS = 120, QR = 5cm and PS = 6cm

Answer

Step 1 – Draw QR = 5cm



Step 2 – Draw angle PQR = 60 degree and PQ = 4.2 cm



Step 3 – Draw angle QPS = 120 degree and PS = 6 cm