5 Constructions

In this chapter, we will revise some basic constructions that you learnt in the previous classes. You will also learn how to construct quadrilaterals, circumcircles and incircles. You will need only a ruler and a compass.

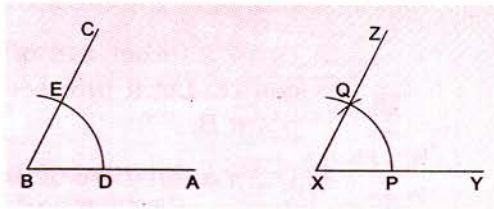
Basic Constructions

To construct an angle equal to a given angle

Construction 1 Construct an angle equal to $\angle ABC$ at the point X.

Steps of construction

1. With B as the centre and a suitable radius, draw an arc to intersect BA at D and BC at E.
2. Draw a line XY through X.
3. With X as the centre and the same radius (as in Step 1), draw an arc which intersects XY at P.
4. With P as the centre and a radius equal to DE, draw an arc which intersects the arc drawn in Step 3 at Q.
5. Join X and Q and extend it to Z. Then, $\angle YXZ$ is the required angle.

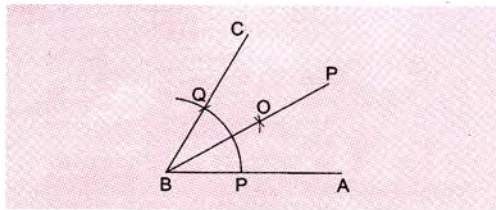


To bisect a given angle

Construction 2 Bisect the given angle ABC.

Steps of construction

1. With B as the centre and a convenient radius, construct an arc which intersects BA at P and BC at Q.
2. With P as the centre and a suitable radius (more than half of PQ), draw an arc.



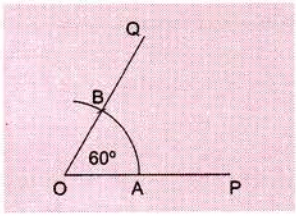
3. With Q as the centre and the same radius, draw another arc to intersect the arc drawn in Step 2 at O.
4. Join B and O and extend it to P. Then, the ray BP bisects $\angle ABC$.

To construct angles of standard magnitudes

Construction 3 Construct an angle of 60°.

Steps of construction

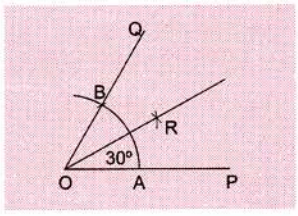
1. Draw a line OP.
2. With O as the centre and a suitable radius, draw an arc to intersect OP at A.
3. Draw another arc of the same radius with A as the centre. Let it intersect the arc drawn in Step 2 at the point B.
4. Draw a ling joining O and B and extend it to Q.
   Then, $\angle POQ$ is the required angle of 60°.



Construction 4 Construct an angle of 30°.

Steps of construction

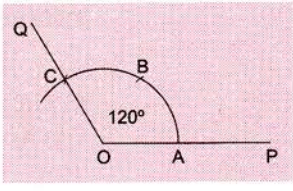
1. Draw $\angle POQ$ of 60° as in the previous construction.
2. Bisect the $\angle POQ$ as in Construction 2.
3. If OR is the bisector of $\angle POQ$ then
   $\angle POR = \angle QOR = 30°$.



Construction 5 Construct an angle of 120°.

Steps of construction

1. Draw a line OP.
2. Draw an arc with O as the centre and a convenient radius to intersect OP at the point A.
3. Draw another arc of the same radius with A as the centre. Let it intersect the arc drawn in Step 2 at the point B.
4. Draw a third arc of the same radius with B as the centre so that it cuts the arc drawn in Step 2 at the point C (away from A).
5. Draw a line joining O and C and extend it to Q.
   $\angle QOP$ is an angle of measure 120°.

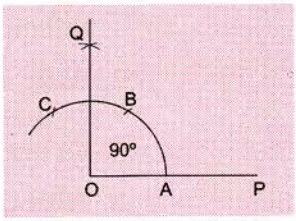


Construction 6 Construct an angle of 90°.

Steps of construction

Follow the Steps 1 to 4 in the previous construction.

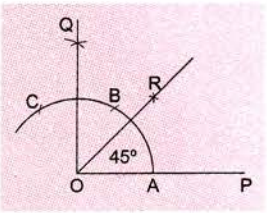
5. Draw an arc of a suitable radius (more than $\frac{1}{2}BC$) with B as the centre.
6. Draw another arc of the same radius with C as the centre. Let this arc intersect the arc drawn in Step 5 at the point Q.
7. Draw a line through O and Q. Then $\angle POQ = 90°$.



Construction 7 Construct an angle of 45°.

Steps of construction

1. Follow the Steps in Construction 6 to draw $\angle POQ = 90°$.
2. Bisect $\angle POQ$ (see Construction 2). If OR is the bisector then $\angle POR = \angle QOR = 45°$.

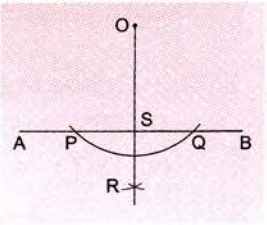


To construct perpendicular lines

Construction 8 Construct a perpendicular to a line AB from an external point O.

Steps of construction

1. Draw a line AB.
2. Mark an external point O.
3. With O as the centre and a sufficiently large radius, draw an arc intersecting AB at the points P and Q.

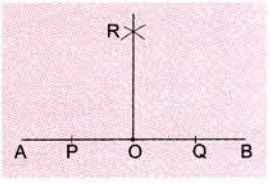


4. With P as the centre and a radius more than $\frac{1}{2}PQ$ ($\neq OP$), draw another arc on any side of AB.
5. With Q as the centre and the same radius, draw a third arc, intersecting the arc drawn in Step 4 at the point R.
6. Draw a line joining O and R. Let it intersect AB at the point S. Then OS is the required perpendicular.

Construction 9 Construct a line perpendicular to a line AB through a point O on the line.

Steps of construction

1. Draw a line AB.
2. Take a point O on AB.
3. Draw an arc with O as the centre and a convenient radius. Let it intersect the line AB at the points P and Q.



4. Draw an arc with P as the centre and a radius more than $\frac{1}{2}PQ$.
5. With Q as the centre and the same radius, construct another arc to intersect the arc drawn in Step 4 at the point R.
6. The line joining O and R is the perpendicular to the line AB at O.

To construct the perpendicular bisector of a line segment

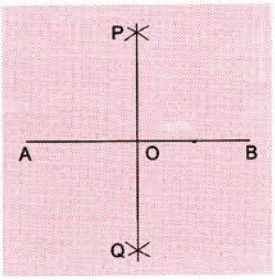
Construction 10 Construct the perpendicular bisector of a line segment AB.

Steps of construction

1. Draw a line segment AB.
2. Draw two arcs with A as the centre and a radius more than $\frac{1}{2}AB$, one on each side of AB.

3. With B as the centre and the same radius, construct two more arcs, one on each side of AB to intersect the arcs drawn in Step 2 at the points P and Q respectively.

4. The line joining P and Q is the perpendicular bisector of AB. Let it intersect AB at O. Then, $OA = OB = \frac{1}{2}AB$ and $\angle AOP = \angle BOP = 90°$.



EXERCISE 5A

1. Draw a line segment $BC = 6.3$ cm. Construct the following angles at the point B.
   (i) 30° (ii) 60° (iii) 90° (iv) 45°
   (v) 120°

2. Construct an angle of $22\frac{1}{2}°$.

3. Construct a line perpendicular to $AB = 8$ cm through a point O on the line such that $OA = 3.8$ cm.

4. Draw a line segment $PQ = 7.3$ cm. Take a point A above PQ such that $AP = 4$ cm. Construct the perpendicular to PQ from A.

5. Draw a line segment $AB = 7.6$ cm and draw its perpendicular bisector PQ.

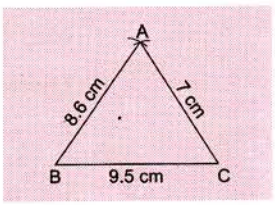
Construction of Triangles

To construct a triangle when three sides are known

Construction 11 Construct a $\triangle ABC$ such that $AB = 8.6$ cm, $BC = 9.5$ cm and $AC = 7$ cm.

Steps of construction

1. Draw a line segment $BC = 9.5$ cm.
2. Draw an arc of radius 8.6 cm with the centre at B.
3. Draw an arc of radius 7 cm with the centre at C. Let this arc intersect the arc drawn in Step 2 at the point A.
4. Join A to B and C. Then $AB = 8.6$ cm, $AC = 7$ cm and $\triangle ABC$ is the required triangle.



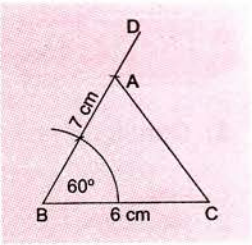
To construct a triangle when two sides and the included angle are given

Construction 12 Construct a triangle ABC in which $BC = 6$ cm, $AB = 7$ cm and $\angle ABC = 60°$.

Steps of construction

1. Draw a line segment BC of length 6 cm.

2. Draw an angle $\angle CBD = 60°$ at B. (See Construction 3.)
3. Draw an arc of radius 7 cm with the centre at B. Let this arc intersect BD at A. Then $AB = 7$ cm.
4. Join A and C.
   $\triangle ABC$ is the required triangle.

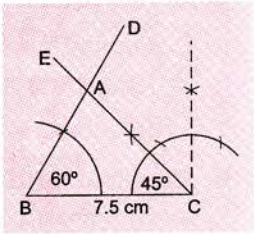


To construct a triangle when one side and two angles are given

Construction 13 Construct a triangle ABC in which $BC = 7.5$ cm, $\angle ABC = 60°$ and $\angle ACB = 45°$.

Steps of construction

1. Draw a line segment $BC = 7.5$ cm.
2. Construct $\angle CBD = 60°$ at B. (See Construction 3.)
3. Construct $\angle BCE = 45°$ at C. (See Construction 7.)
4. Let CE and BD intersect at A.
   $\triangle ABC$ is the required triangle.



Note If $\angle BAC$ and $\angle ABC$ are given, you will have to calculate $\angle ACB$ by using $\angle A + \angle B + \angle C = 180°$. Similarly, if $\angle BAC$ and $\angle ACB$ are given, you will have to calculate $\angle ABC$.

To construct an equilateral triangle when its side is known

Construction 14 Construct an equilateral triangle XYZ of side = 5 cm.

Proceed as in Construction 11. Here, $XY = YZ = ZX = 5$ cm.

To cnstruct an isosceles triangle in which the base and the base angles are given

Construction 15 Construct an isosceles triangle ABC in which $BC = 6.5$ cm, $\angle ABC = \angle ACB = 30°$.

Proceed as in Construction 13. Here, $BC = 6.5$ cm, $\angle ABC = 30°$ and $\angle ACB = 30°$.

To construct an isosceles triangle in which the equal sides and the vertical angle are given

Construction 16 Construct an isosceles $\triangle ABC$ in which $\angle BAC = 45°$ and $AB = AC = 6$ cm.

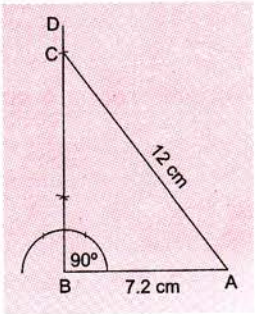
Proceed as in Construction 12. Here, $AB = 6$ cm, $AC = 6$ cm and the included $\angle BAC = 45°$.

To construct a right-angled triangle when a side and the hypotenuse are given

Construction 17 Construct a right-angled triangle in which $\angle ABC = 90°$, $AB = 7.2$ cm and $AC = 12$ cm.

Steps of construction

1. Draw a line segment $BA = 7.2$ cm.
2. Draw $\angle ABD = 90°$ at B.
3. With A as the centre, draw an arc of radius 12 cm. Let this arc intersect BD at C.
4. Join A and C. $\triangle ABC$ is the required triangle.



EXERCISE 5B

1. Construct a $\triangle ABC$ in which

(i) $AB = 6$ cm, $BC = 5$ cm and $AC = 4$ cm (ii) the sides are 6.8 cm, 5 cm and 3.8 cm

2. Construct a $\triangle XYZ$ such that

(i) $XY = 4$ cm, $YZ = 6$ cm and $\angle Y = 60°$ (ii) $XY = 4.4$ cm, $XZ = 3$ cm and $\angle X = 120°$

3. Construct a $\triangle PQR$ such that

(i) $\angle P = 60°$, $\angle Q = 45°$ and $PQ = 7$ cm (ii) $\angle Q = 60°$, $\angle R = 30°$ and $QR = 5.6$ cm

4. Construct an equilateral triangle of side (i) 6 cm and (ii) 4.5 cm.

5. Construct an isosceles triangle ABC in which

(i) $AB = 4.8$ cm, $\angle A = 30°$, $\angle B = 30°$ (ii) $AB = 8.6$ cm, $\angle A = 45°$, $\angle B = 45°$

(iii) $\angle BAC = 60°$, $AB = AC = 6.5$ cm (iv) $\angle ABC = 30°$, $AB = BC = 5$ cm

6. Construct a right-angled triangle ABC in which

(i) $\angle B = 90°$, $AC = 6$ cm, $AB = 4$ cm (ii) $\angle A = 90°$, $BC = 13$ cm, $AC = 5$ cm

7. Construct a right-angled triangle ABC in which $\angle C = 90°$, $BC = 5$ cm, $AC = 6$ cm.

Construction of Quadrilaterals

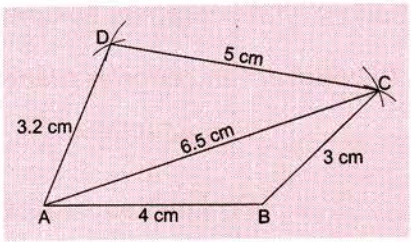
A quadrilateral has 10 elements (or parts)—four sides, four angles and two diagonals. Five elements are sufficient for constructing a quadrilateral.

To construct a quadrilateral when four sides and one diagonal are given

Construction 18 Construct a quadrilateral $ABCD$ in which $AB = 4$ cm, $BC = 3$ cm, $CD = 5$ cm, $DA = 3.2$ cm and $AC = 6.5$ cm.

Steps of construction

1. Draw a line segment $AB = 4$ cm.
2. With B as the centre, draw an arc of radius 3 cm.
3. With A as the centre, draw an arc of radius 6.5 cm to intersect the arc drawn in Step 2 at C.



4. With C as the centre, draw an arc of radius 5 cm.
5. With A as the centre draw an arc of radius 3.2 cm to intersect the arc drawn in Step 4 at D.
6. Join C and A; C and B; C and D; and D and A.
   $ABCD$ is the required quadrilateral.

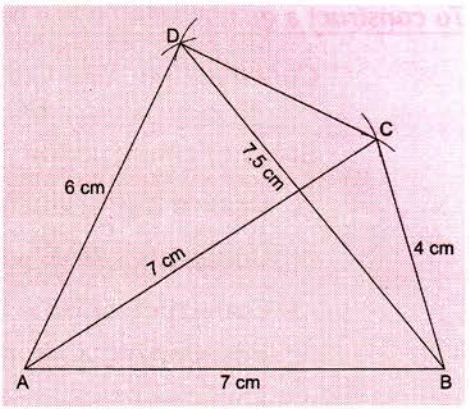
To construct a quadrilateral when three sides and two diagonals are given

Construction 19 Construct a quadrilateral $ABCD$ in which $AB = 7$ cm, $AD = 6$ cm, $AC = 7$ cm, $BD = 7.5$ cm and $BC = 4$ cm.

Steps of construction

1. Draw a line segment $AB = 7$ cm.

2. With A as the centre, draw an arc of radius 6 cm.
3. With B as the centre, draw an arc of radius 7.5 cm to intersect the arc drawn in Step 2 at D.
4. With A as the centre, draw an arc of radius 7 cm.
5. With B as the centre, draw an arc of radius 4 cm to intersect the arc drawn in Step 4 at C.



6. Join C and B; C and A; C and D; D and A and D and B.

   $ABCD$ is the required quadrilateral.

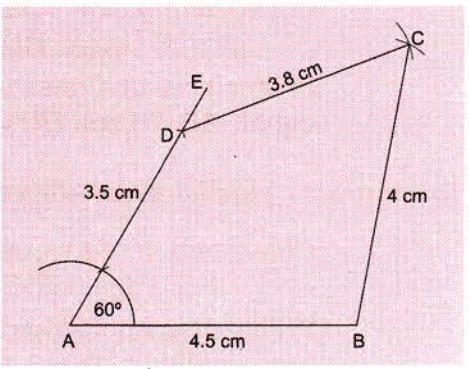
To construct a quadrilateral when four sides and an angle are given

Construction 20 Construct a quadrilateral $ABCD$ in which $AB = 4.5$ cm, $BC = 4$ cm, $CD = 3.8$ cm and $AD = 3.5$ cm and $\angle A = 60°$.

Steps of construction

1. Draw a line segment $AB = 4.5$ cm.
2. Draw an angle $\angle BAE = 60°$ at A.
3. Cut off $AD = 3.5$ cm from AE.
4. With D as the centre, draw an arc of radius 3.8 cm.
5. With B as the centre, draw an arc of radius 4 cm to intersect the arc drawn in Step 4 at C.
6. Join B and D to C.

   Then $ABCD$ is the required quadrilateral.



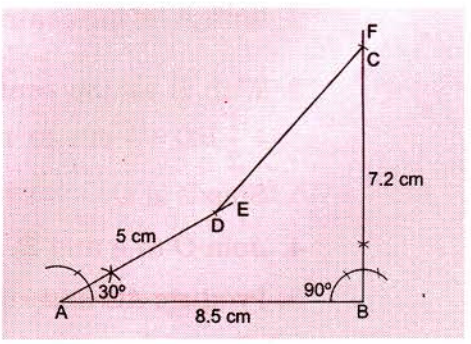
To construct a quadrilateral when three sides and two included angles are given

Construction 21 Construct a quadrilateral $ABCD$ in which $AB = 8.5$ cm, $BC = 7.2$ cm, $AD = 5$ cm, $\angle B = 90°$, $\angle A = 30°$.

Steps of construction

1. Draw a line segment $AB = 8.5$ cm.
2. Construct $\angle BAE = 30°$ at A.
3. Cut off $AD = 5$ cm from AE.
4. Construct $ABF = 90°$ at B.
5. Cut off $BC = 7.2$ cm from BF.
6. Join C and D.

   $ABCD$ is the required quadrilateral.



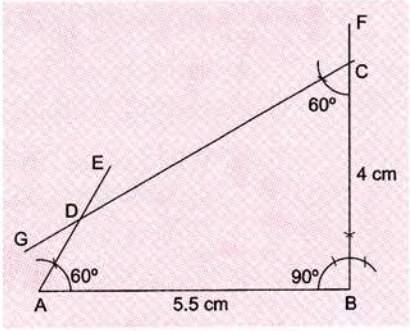
To construct a quadrilateral when two adjacent sides and three angles are given

Construction 22 Construct a quadrilateral $ABCD$ in which $AB = 5.5$ cm, $BC = 4$ cm, $\angle A = 60°$, $\angle B = 90°$ and $\angle C = 60°$.

Steps of construction

1. Draw a line segment $AB = 5.5$ cm.
2. Construct $\angle BAE = 60°$ at A.
3. Construct $\angle ABF = 90°$ at B.
4. Cut off $BC = 4$ cm from BF.
5. Construct $\angle BCG = 60°$ at C. CG intersects AE at D.

   $ABCD$ is the required quadrilateral.



Note If $\angle D$ were given, we would have to find $\angle C$ by using $\angle C = 360° - (\angle A + \angle B + \angle D)$.

Construction of parallelograms

To construct a parallelogram when two adjacent sides and the included angle are given

Construction 23 Construct a parallelogram $ABCD$ in which $AB = 6$ cm, $AD = 8$ cm and $\angle A = 60°$.

Proceed as in Construction 20. As the opposite sides of a parallelogram are equal, $AB = 6$ cm, $BC = 8$ cm, $CD = 6$ cm, $AD = 8$ cm and $\angle A = 60°$.

To construct a parallelogram when two adjacent sides and one diagonal are given

Construction 24 Construct a parallelogram $ABCD$ in which $AB = 5.2$ cm, $BC = 4.8$ cm and $AC = 7.4$ cm.

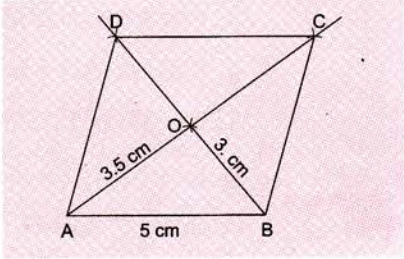
Proceed as in Construction 18. Since the opposite sides of a parallelogram are equal, $AB = 5.2$ cm, $BC = 4.8$ cm, $CD = 5.2$ cm, $AD = 4.8$ cm and $AC = 7.4$ cm.

To construct a parallelogram when one side and both diagonals are given

Construction 25 Construct a parallelogram $ABCD$ in which $AB = 5$ cm, $AC = 7$ cm and $BD = 6$ cm.

Steps of construction

1. Draw a line segment $AB = 5$ cm.
2. With A as the centre, draw an arc of radius $= \frac{1}{2} AC = 3.5$ cm.
3. With B as the centre, draw an arc of radius $= \frac{1}{2} BD = 3$ cm to intersect the arc drawn in Step 2 at O.
4. Join O to A and B.
5. Produce AO and cut off $OC = OA = 3.5$ cm.

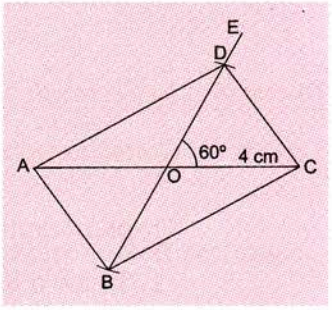


6. Produce BO and cut off $OD = OB = 3$ cm.
7. Join D and A; D and C; and C and B.
   $ABCD$ is the required parallelogram.

To construct a parallelogram when the two diagonals and an angle between them are given

Construction 26 Construct a parallelogram $ABCD$ in which $AC = 4$ cm, $BD = 5$ cm and an angle between them is 60°.

Steps of construction



1. Draw a line segment $AC = 4$ cm.
2. Bisect AC. Let O be its mid-point.
3. Construct $\angle COE = 60°$ at O.
4. Cut off $OD = \frac{1}{2}BD = 2.5$ cm from OE.
5. Produce DO and cut off $OB = DO = 2.5$ cm.
6. Join D, A; D, C; A, B and B, C.
   $ABCD$ is the required parallelogram.

EXERCISE 5C

1. Construct a quadrilateral $ABCD$ in which

(i) $AB = 4.5$ cm, $BC = 4$ cm, $CD = 6.5$ cm, $DA = 3$ cm and $BD = 6.5$ cm

(ii) $AB = 4$ cm, $BC = 3$ cm, $AD = 2.5$ cm, $AC = 4.5$ cm and $BD = 10$ cm

(iii) $AB = 6.4$ cm, $BC = 5.8$ cm, $AD = 3.6$ cm, $CD = 3.6$ cm and $\angle B = 45°$

(iv) $\angle B = 45°$, $\angle C = 90°$, $BC = 5$ cm, $AB = 4$ cm and $CD = 3$ cm

(v) $AB = 4.5$ cm, $BC = 3.8$ cm, $\angle BCD = 90°$, $\angle BAD = 60°$ and $\angle ABC = 120°$.

2. Construct a parallelogram in which

(i) $AB = 7.4$ cm, $BC = 5.2$ cm and $\angle ABC = 120°$

(ii) $AB = 3.6$ cm, $BC = 4$ cm and $AC = 6.5$ cm

(iii) $AC = 8$ cm, $BD = 14$ cm and $CD = 8$ cm

(iv) diagonals are 6.5 cm and 4 cm long and angle between them is 60°.

Construction of Rectangles

To construct a rectangle when its length and breadth are given

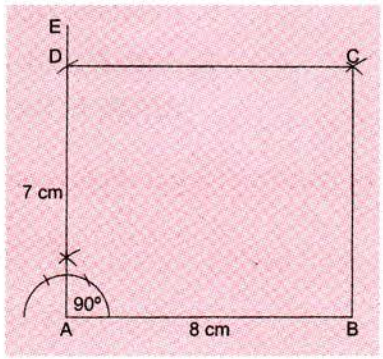
Construction 27 Construct a rectangle $ABCD$ with $AB = 8$ cm and $AD = 7$ cm.

Steps of construction

1. Draw a line segment $AB = 8$ cm.
2. Construct $\angle BAE = 90°$ at A.

3. Cut off $AD = 7$ cm from AE.
4. Draw an arc of radius 8 cm with D as the centre.
5. Draw another arc of radius 7 cm with B as the centre to intersect the arc drawn in Step 4 at C.
6. Join C to B and D.

   Then $ABCD$ is the required rectangle.



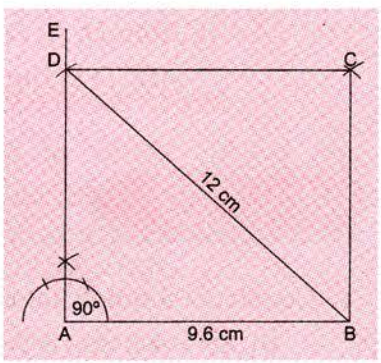
To construct a rectangle when a side and a diagonal are given

Construction 28 Construct a rectangle $ABCD$ with $AB = 9.6$ cm and $BD = 12$ cm.

Steps of construction

1. Draw a line segment $AB = 9.6$ cm.
2. Construct $\angle BAE = 90°$ at A.
3. Draw an arc of radius 12 cm with B as the centre to intersect AE at D.
4. Draw an arc of radius 9.6 cm with D as the centre.
5. With B as the centre, draw an arc of radius equal to AD to intersect the arc drawn in Step 4 at C.
6. Join C to B and D. Also, join B and D.

   $ABCD$ is the required rectangle.



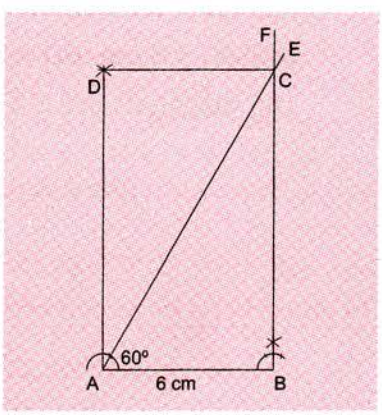
To construct a rectangle when a side and the angle between the side and a diagonal are given

Construction 29 Construct a rectangle $ABCD$ with $AB = 6$ cm and $\angle BAC = 60°$.

Steps of construction

1. Draw a line segment $AB = 6$ cm.
2. Construct $\angle BAE = 60°$ at A.
3. Construct $\angle ABF = 90°$ at B, such that BF intersects AE at C.
4. Draw an arc of radius 6 cm with C as the centre.
5. Draw an arc of radius BC with A as the centre to intersect the arc drawn in Step 4 at D.
6. Join C and A to D.

   $ABCD$ is the required rectangle.

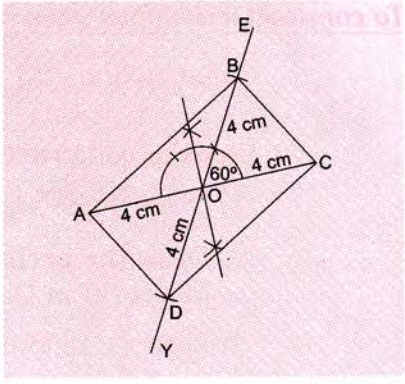


To construct a rectangle when a diagonal and an angle between the two diagonals are given

Construction 30 Construct a rectangle $ABCD$ with the diagonal $AC = 8$ cm and an angle between the two diagonals $= 60°$.

Steps of construction

1. Draw a line segment $AC = 8$ cm.
2. Bisect AC. Let its mid-point be O.
3. Construct $\angle COE = 60°$ at O.
4. Cut off $OB = \frac{1}{2} AC = 4$ cm from OE.
5. Produce BO to Y.
6. Cut off $OD = \frac{1}{2} AC = 4$ cm from OY.
7. Join A to B and D, and C to B and D. $ABCD$ is the required rectangle.



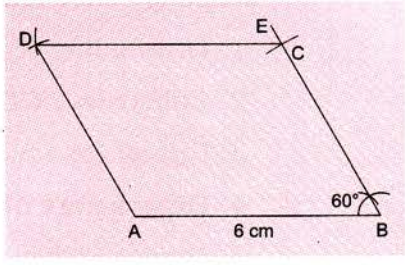
Construction of rhombuses

To construct a rhombus when one side and one angle are given

Construction 31 Construct a rhombus $ABCD$ with $AB = 6$ cm and $\angle ABC = 60°$.

Steps of construction

1. Draw a line segment $AB = 6$ cm.
2. Construct $\angle ABE = 60°$ at B.
3. Cut off $BC = 6$ cm from BE.
4. Draw an arc of radius 6 cm with C as the centre.
5. Draw another arc of radius 6 cm with A as the centre to intersect the arc drawn in Step 4 at D.
6. Join D to C and A. Thus, $ABCD$ is the required rhombus.

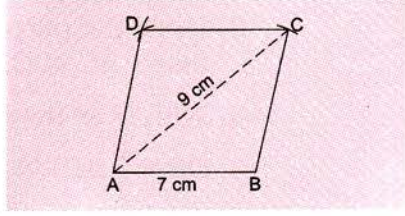


To construct a rhombus when a side and a diagonal are given

Construction 32 Construct a rhombus $ABCD$ with $AB = 7$ cm and diagonal $AC = 9$ cm.

Steps of construction

1. Draw a line segment $AB = 7$ cm.
2. With A as the centre, draw an arc of radius 9 cm.
3. With B as the centre, draw another arc of radius 7 cm to intersect the arc drawn in Step 2 at C.
4. With C as the centre, draw another arc of radius 7 cm.



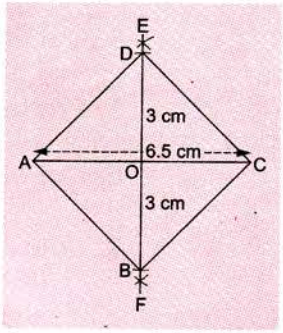
5. Draw another arc of radius 7 cm with A as the centre to intersect the arc drawn in Step 4 at D.
6. Join C to B, A and D, and D to A. $ABCD$ is the required rhombus.

To construct a rhombus when its diagonals are given

Construction 33 Construct a rhombus $ABCD$, given $AC = 6.5$ cm and $BD = 6$ cm.

Steps of construction

1. Draw a line segment $AC = 6.5$ cm.
2. Draw the perpendicular bisector EF of AC. Let EF bisect AC at O.
3. With O as centre, cut off $OD = \frac{1}{2}BD = 3$ cm and $OB = \frac{1}{2}BD = 3$ cm from OE and OF respectively.
4. Joint D to A and C, and B to A and C.
   $ABCD$ is the required rhombus.



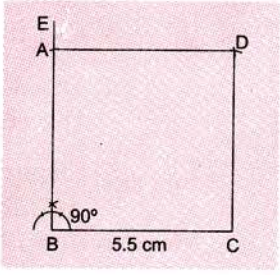
Construction of squares

To construct a square when the side is given

Construction 34 Construct a square $ABCD$, given $BC = 5.5$ cm.

Steps of construction

1. Draw a line segment $BC = 5.5$ cm.
2. Construct $\angle CBE = 90°$ at B.
3. Cut off $BA = 5.5$ cm from BE.
4. Draw an arc of radius 5.5 cm with A as the centre.
5. Draw another arc of radius 5.5 cm with C as the centre to intersect the arc drawn in Step 4 at D.
6. Join A and C to D. $ABCD$ is the required square.

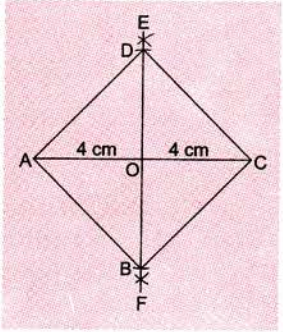


To construct a square when the diagonal is given

Construction 35 Construct a square $ABCD$, given diagonal $AC = 8$ cm.

Steps of construction

1. Draw a line segment $AC = 8$ cm.
2. Draw the perpendicular bisector EF of AC. Let EF bisect AC at O.
3. With O as the centre, cut off $OD = \frac{1}{2}AC = 4$ cm and $OB = \frac{1}{2}AC = 4$ cm from OE and OF respectively.
4. Join B to A and C and D to A and C.
   $ABCD$ is the required square.



EXERCISE 5D

1. Construct a rectangle $ABCD$ in which

(i) $AB = 7$ cm and $BC = 9$ cm (ii) $AB = 12$ cm and $AC = 13$ cm

(iii) $AB = 8$ cm and $\angle BAC = 60°$

(iv) $BD = 7$ cm and an angle between the two diagonals $= 60°$

2. Construct a rhombus $ABCD$ in which

(i) each side $= 6$ cm and $\angle B = 45°$ (ii) $AB = 4.7$ cm and $AC = 6.2$ cm

(iii) $AC = 6$ cm, $BD = 4$ cm

3. Construct a square $ABCD$ in which

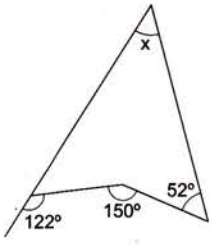
(i) each side $= 5$ cm (ii) diagonal $AC = 9$ cm

❖

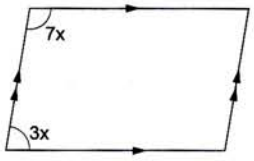
Revision Exercise 2

1. Find the sum of the interior angles of a 11-gon.
2. The sum of the interior angles of a n-gon is 8280°. Find the value of n.
3. Five angles of a polygon are 162° each and the remaining angles are 150° each. Find the number of sides of the polygon.
4. Find the number of sides of a regular polygon if one of its interior angles equals
   (i) 168°45′ (ii) 172°30′.
5. Five angles of a nonagon are in the ratio 9 : 10 : 11 : 12 : 13 and rest of the angles equal 120° each. Find the largest angle.
6. The sum of interior angles of a regular polygon is thrice the sum of its exterior angles. Find number of sides of the polygon.
7. Find x in each of the following figures.

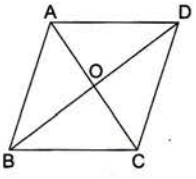
(i)



(ii)



8. In the adjoining figure, $ABCD$ is a rhombus. Prove that $\Delta OAB \cong \Delta OAD$.



9. Construct a ΔABC in which
   (i) $AB = 8$ cm, $BC = 8.5$ cm and $AC = 7$ cm
   (ii) $\angle A = 60°$, $AB = 3.8$ cm, $AC = 5.5$ cm
   (iii) $\angle B = 30°$, $\angle C = 60°$ and $BC = 7$ cm
   (iv) $\angle A = 30°$, $\angle B = 45°$ and $AB = 6.3$ cm
10. Construct a rectangle $ABCD$ in which
   (i) $AB = 8$ cm and $BC = 8.7$ cm (ii) $AB = 6$ cm and $BD = 6.5$ cm
   (iii) $BC = 6.8$ cm and $\angle CBD = 45°$
   (iv) $AC = 8$ cm and an angle between two diagonals = 30°
11. Construct a rhombus $PQRS$ in which
   (i) each side = 7 cm and $\angle Q = 60°$ (ii) $QR = 7$ cm and $QS = 8.5$ cm
   (iii) $PR = 7.3$ cm, $QS = 6$ cm
12. Construct a square $ABCD$ in which
   (i) each side = 6 cm (ii) diagonal $BD = 8$ cm

ANSWERS

1. 1620° **2.** 48 **3.** 14 **4.** (i) 32 (ii) 48 **5.** $184\frac{4}{11}°$ **6.** 8
7. (i) 40° (ii) 18°

❖