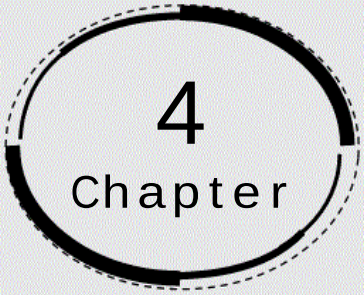
# practical geometry




## Exercise 4.1 Chapter 4 - Practical Geometry

**1. Construct the following quadrilaterals.**

**(i) Quadrilateral ABCD**

**AB = 4.5cm**

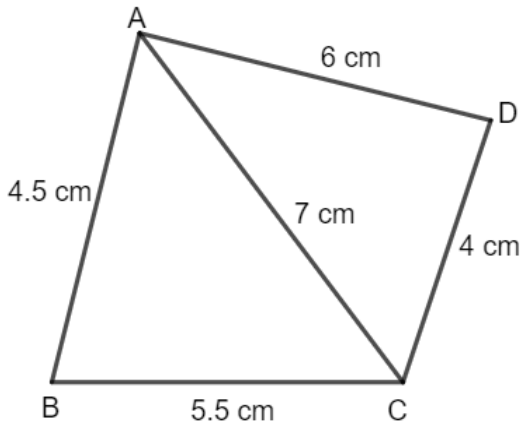
**BC = 5.5cm**

**CD = 4cm**

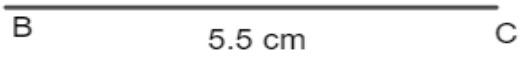
**AD = 6cm**

**AC = 7cm**

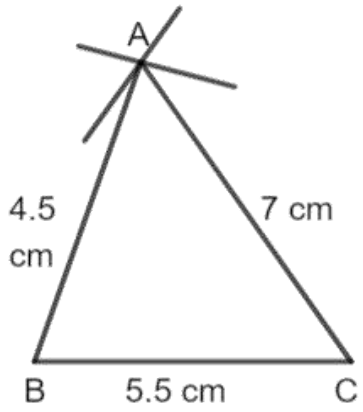
**Ans:** Let us first draw the rough diagram of the given quadrilateral.



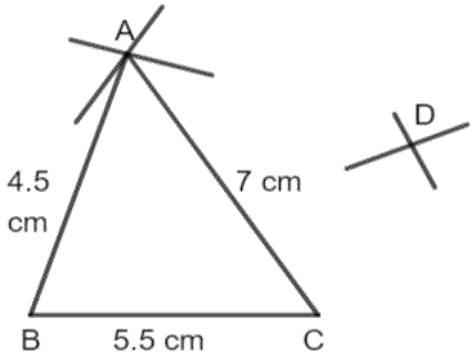

(1) Draw BC=5.5 cm



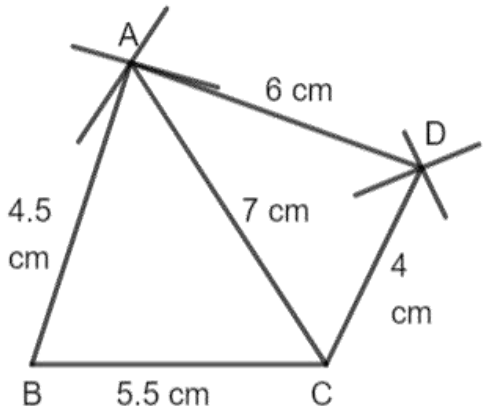
(2) Draw $\triangle ABC$ by using the given measurement as follows:




(3) Since $D$ is $6$ cm away from the vertex $A$. So take $A$ as center and draw an arc of $6$ cm . The vertex $D$ is $4$ cm away from $C$. So draw an arc of radius $4$ cm from $C$ cutting the previous arc.




(4) Join $AD$ and $CD$.




Thus $ABCD$ is the required quadrilateral.

**(ii) Quadrilateral JUMP**

**JU=3.5 cm**

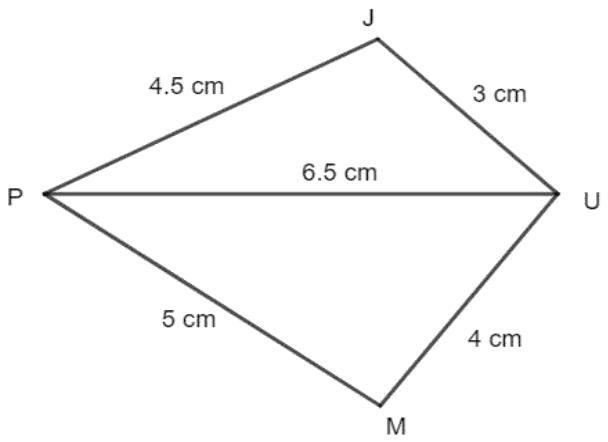
**UM=4 cm**

**MP=5 cm**

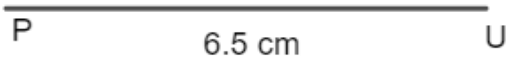
**PJ=4.5 cm**

**PU=6.5 cm**

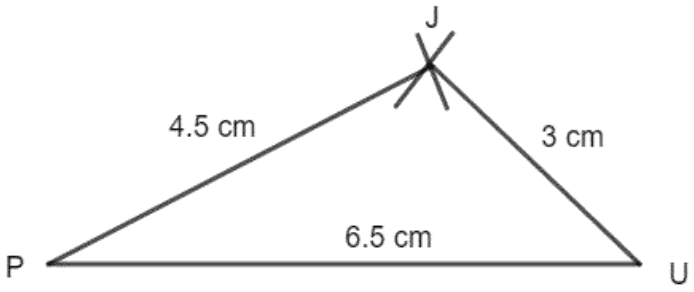
**Ans:** Let us first draw the rough diagram of the given quadrilateral



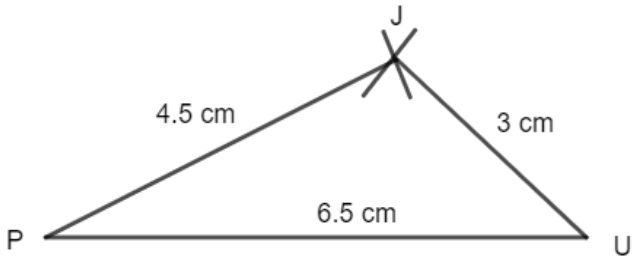

(1) Draw $PU=6.5$ cm



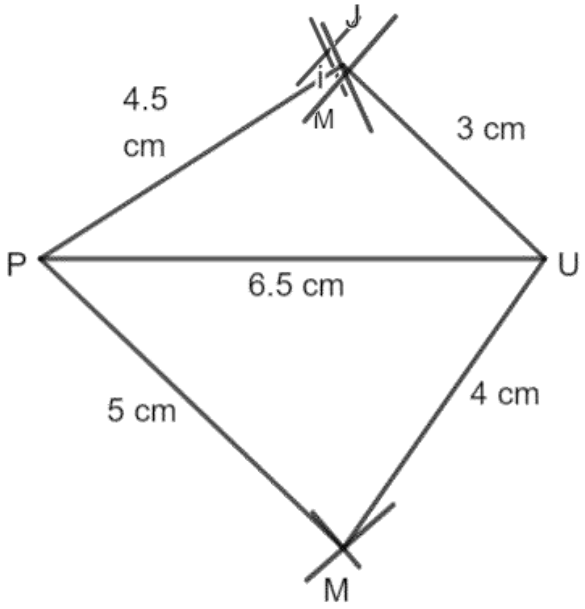

(2) Draw $\triangle JUP$ by using the given measurement as follows:




(3) Since vertex $M$ is $5$ cm away from the vertex $P$. So take $P$ as center and draw an arc of radius $5$ cm . The vertex $M$ is $4$ cm away from $U$. So draw an arc of radius $4$ cm from $U$ cutting the previous arc.




(4) Join PM and UM.




Thus JUMP is the required quadrilateral.

**(iii) Parallelogram MORE**

**OR=6 cm**

**RE=4.5 cm**

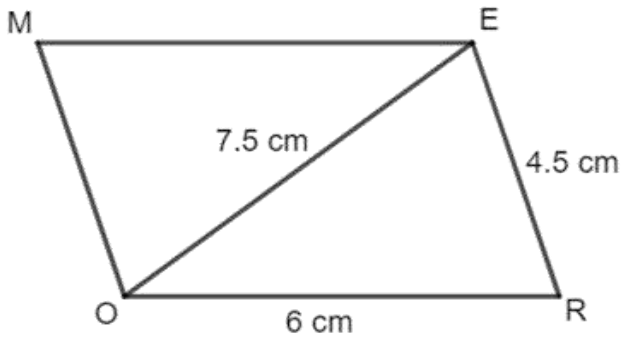
**EO=7.5 cm**

**Ans:** Since the opposite sides of parallelogram are equal,

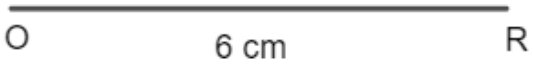
ME=OR

MO=ER

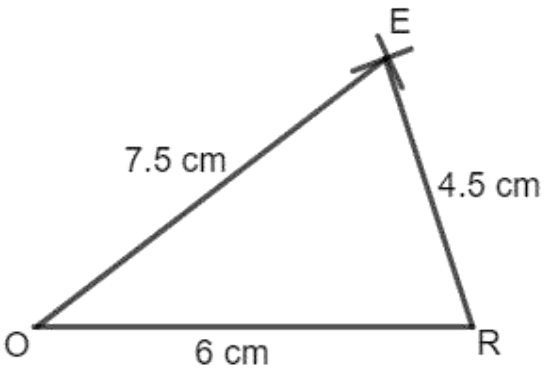
Let us first draw the rough diagram of the parallelogram.



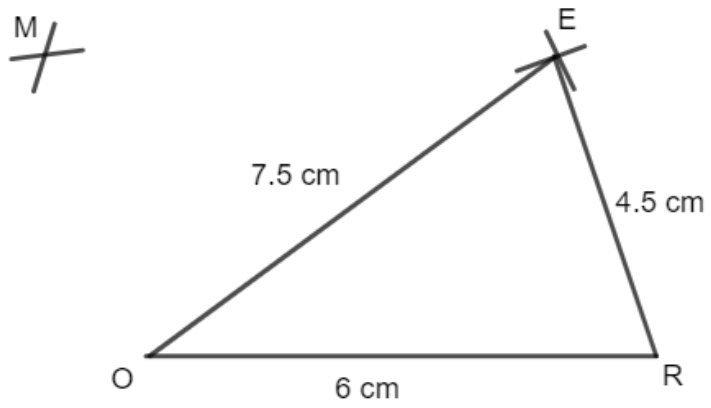

(1) Draw $OR=6$ cm



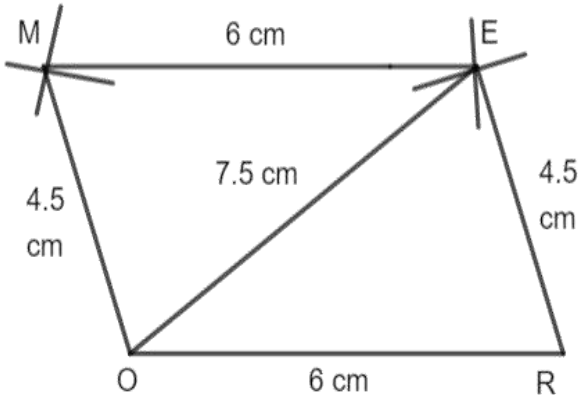

(2) Construct $\triangle EOR$ by using the given measurement as follows:




(3) Since vertex $M$ is $4.5$ cm away from the vertex $O$. So take $O$ as center and draw an arc of radius $4.5$ cm . The vertex $M$ is $6$ cm away from $E$. So draw an arc of radius $6$ cm from $E$ cutting the previous arc.




(4) Join OM and EM.




Thus MORE is the required parallelogram.

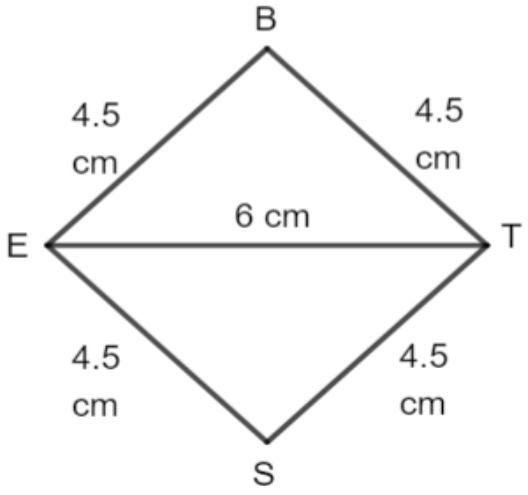
**(iv) Rhombus BEST**

**BE=4.5 cm**

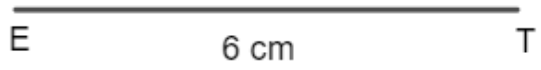
**ET=6 cm**

**Ans:** All sides of the rhombus are equal,

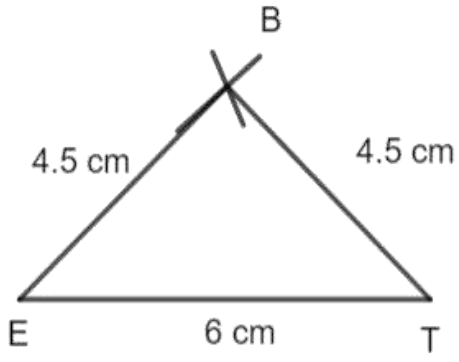
Let us first draw the rough diagram of the rhombus.




(1) Draw $ET=6$ cm

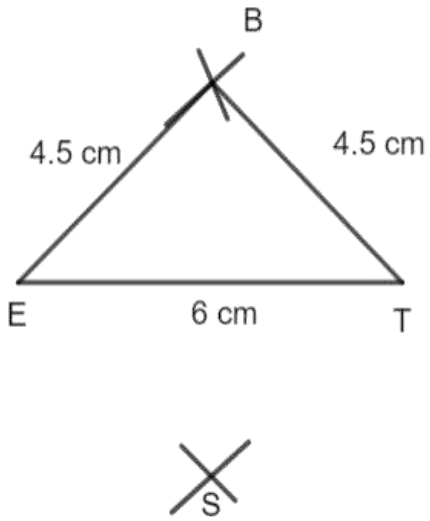



(2) Construct $\triangle BET$ by using the given measurement as follows:

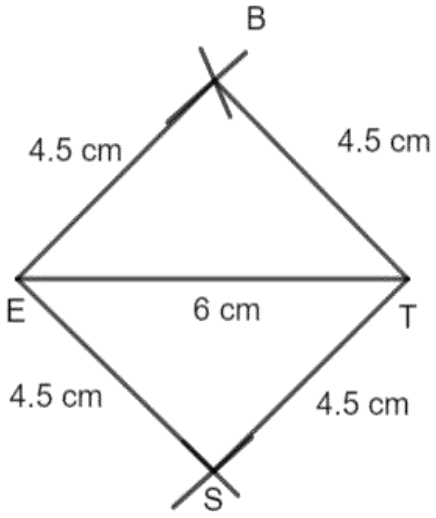



(3) Since vertex $S$ is $4.5$ cm away from the vertex $E$. So take $E$ as center and

draw an arc of radius $4.5\ cm$ . The vertex S is $4.5\ cm$ away from T. So draw an arc of radius $4.5\ cm$ from T cutting the previous arc.




(4) Join ES and ST.




Thus BEST is the required rhombus.

**Exercise 4.2**

**1. Construct the following quadrilaterals.**

**(i) Quadrilateral LIFT**

**LI=4 cm**

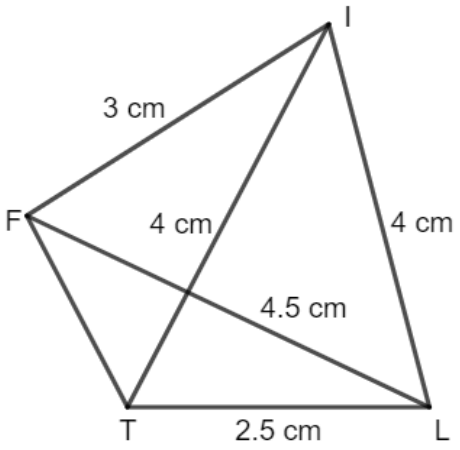
**IF=3 cm**

**TL=2.5 cm**

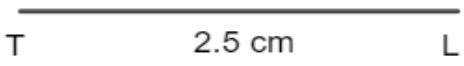
**LF=4.5 cm**

**IT=4 cm**

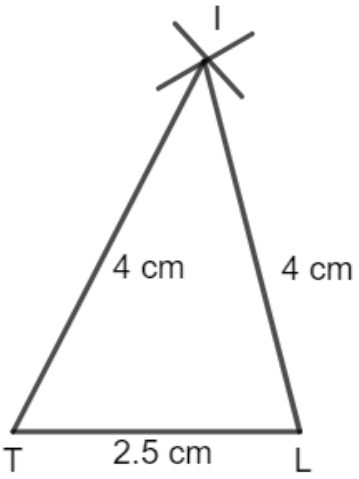
**Ans:** Let us first draw the rough diagram of the given quadrilateral.



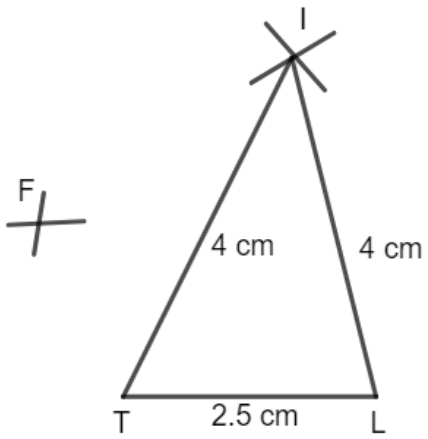

(1) Draw TL=2.5 cm



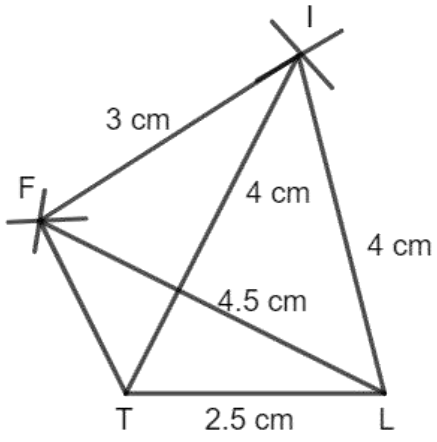

(2) Draw △ITL by using the given measurement as follows:




(3) Since $F$ is $4.5$ cm away from the vertex $L$. So take $L$ as center and draw an arc of $4.5$ cm . The vertex $F$ is $3$ cm away from $I$. So draw an arc of radius $3$ cm from $I$ cutting the previous arc.




(4) Join $LF, TF$ and $IF$.




Thus $LIFT$ is the required quadrilateral.

**(ii) Quadrilateral GOLD**

**OL=7.5 cm**

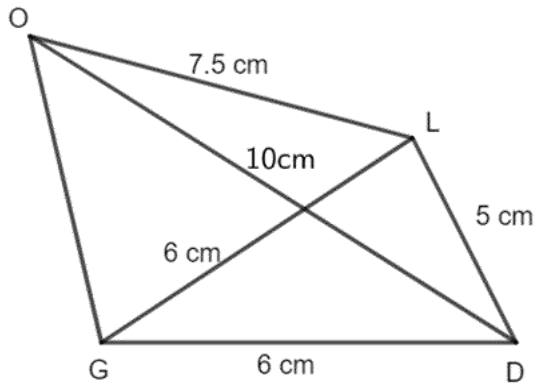
**GL=6 cm**

**GD=6 cm**

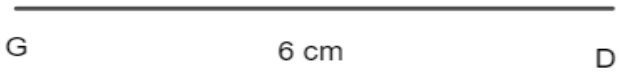
**LD=5 cm**

**OD=10 cm**

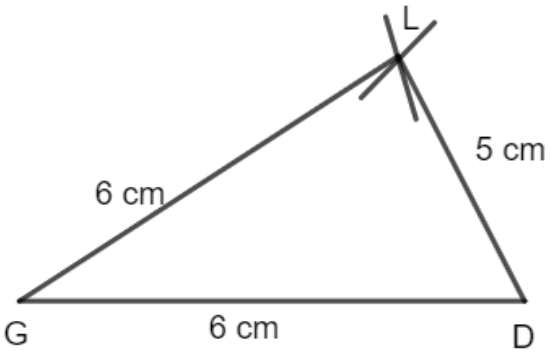
**Ans:** Let us first draw the rough diagram of the given quadrilateral.



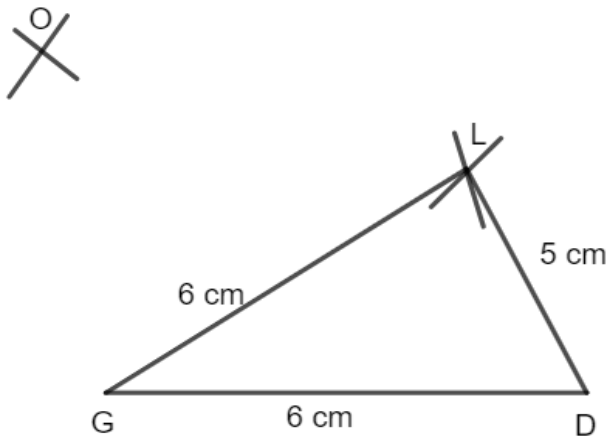

(1) Draw GD=6 cm



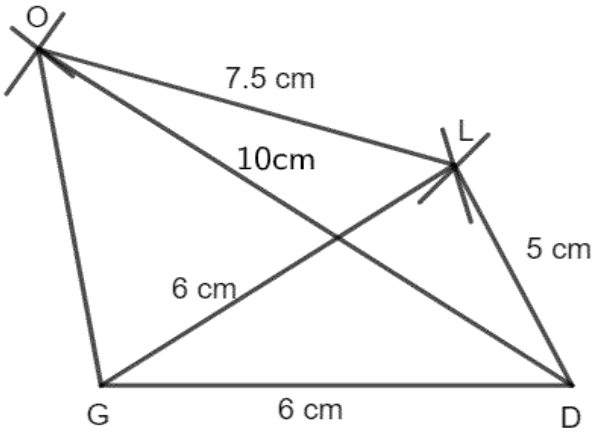

(2) Draw △GDL by using the given measurement as follows:



(3) Since O is 10 cm away from the vertex D. So take D as center and draw an arc of 10 cm . The vertex O is 7.5 cm away from L. So draw an arc of radius 7.5 cm from L cutting the previous arc.




(4) Join OD, LO and GO.




Thus GOLD is the required quadrilateral.

**(iii) Rhombus BEND**

**BN=5.6 cm**

**DE=6.5 cm**

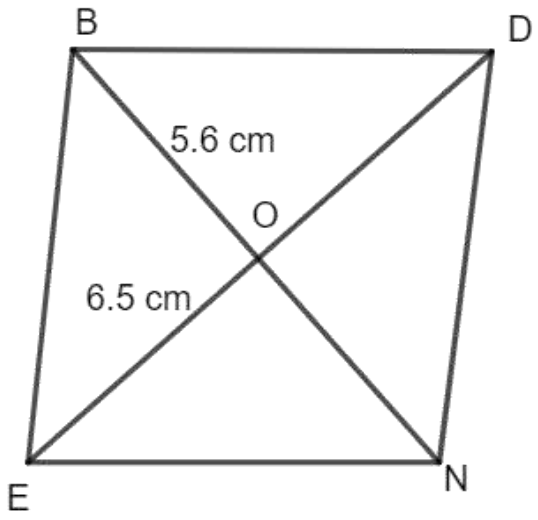
**Ans:** Let us first draw the rough diagram of given rhombus

The diagonals of the rhombus bisect each other at $90^{\circ}$ . Let us assume that the intersecting at the point $O$ in the rhombus.

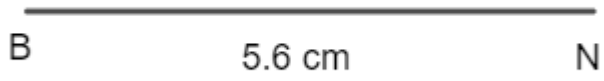
Since $ED=6.5$ cm

$EO = OD$

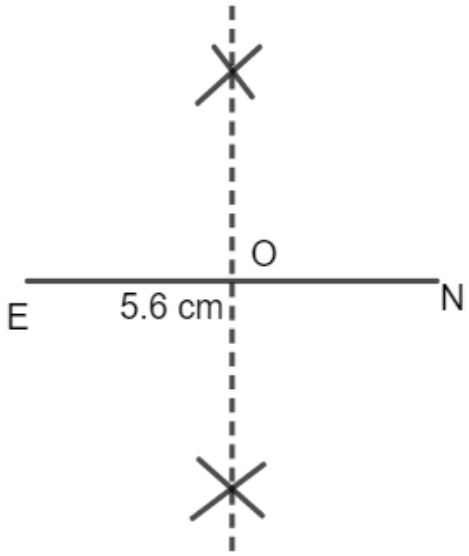
$=3.25$ cm



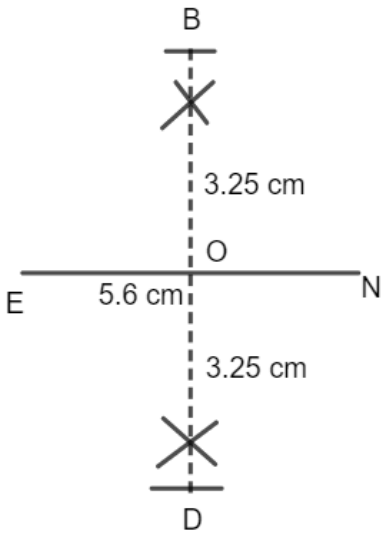

(1) Draw a line segment $BN=5.6$ cm



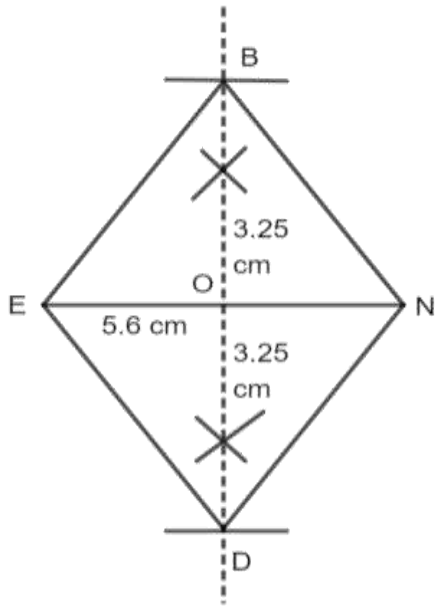

(2) Draw a perpendicular bisector of the line $BN$. Let the bisector intersect the line segment $BN$ at point $O$.




(3) Taking $O$ as center, draw arcs of radius $3.25$ cm to intersect he perpendicular bisector at the point $D, E$




(4) Join $BD, BE, ND$ and $NE$.




Thus BEND is the required rhombus.

**Exercise 4.3**

**1. Construct the following quadrilateral**

**(i) Quadrilateral MORE**

**MO=6 cm**

**OR=4.5 cm**

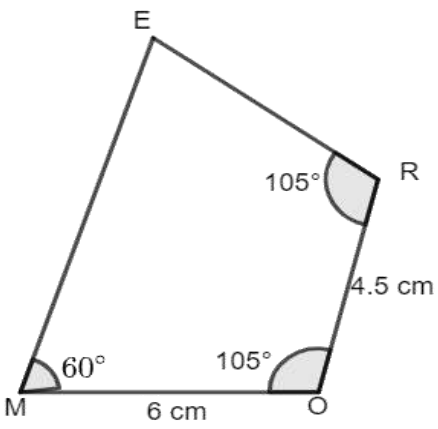
$\angle \mathbf{M} = \mathbf{60}^{\circ}$

$\angle \mathbf{O} = \mathbf{105}^{\circ}$

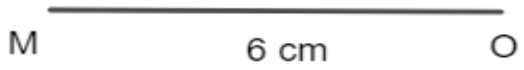
$\angle \mathbf{R} = \mathbf{105}^{\circ}$

**Ans:**

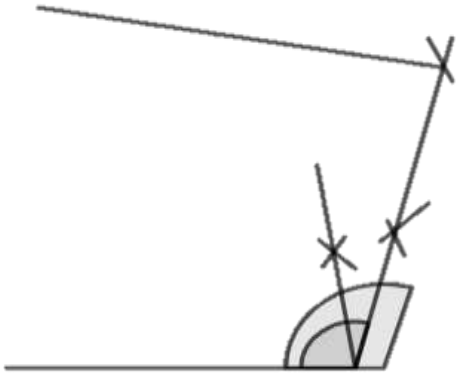
(1) Let us first draw the rough diagram of the quadrilateral.



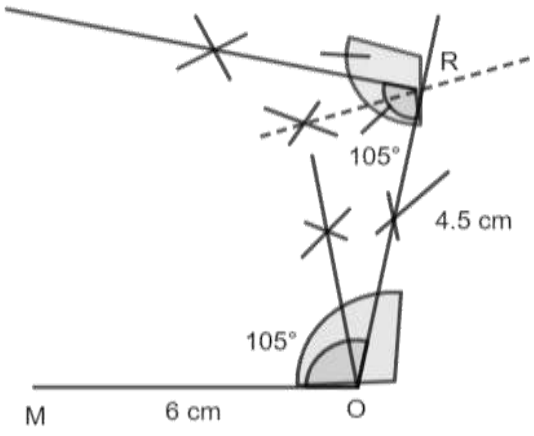
(2) Draw a line segment MO=6 cm



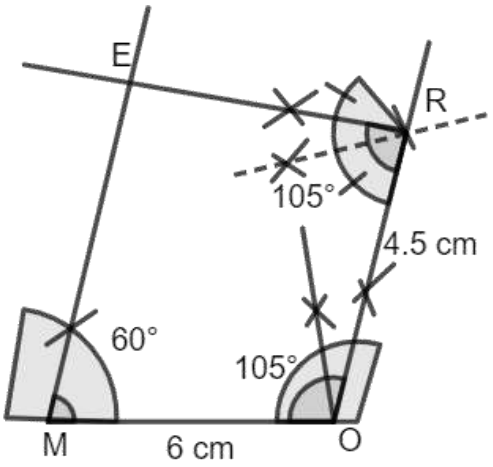

(3) Draw an angle $\angle M = 105^{\circ}$ at the point O. As vertex R is 4.5 cm away from the vertex O, cut a line segment OR=4.5 cm from this ray.



(3) Draw an angel $\angle R = 105^{\circ}$




(4) Draw an angle of $\angle M = 60^{\circ}$




Thus MORE is the required quadrilateral.

**(ii) Quadrilateral PLAN**

**PL=4 cm**

**LA=6.5 cm**

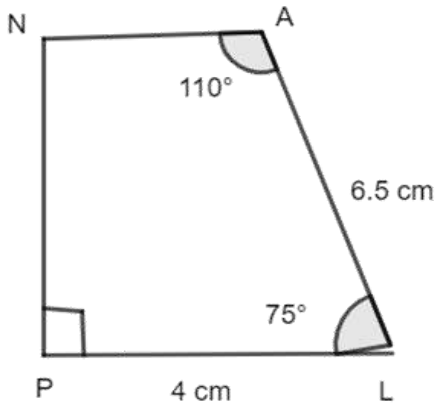
$\angle \mathbf{P} = \mathbf{90}^{\circ}$

$\angle \mathbf{A} = \mathbf{110}^{\circ}$

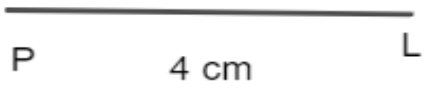
$\angle \mathbf{N} = \mathbf{85}^{\circ}$

**Ans:**

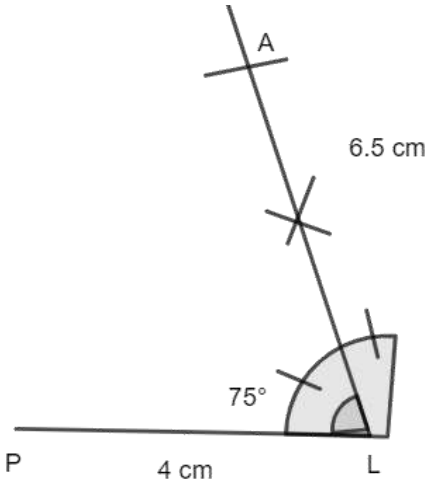
(1) Let us first draw the rough diagram of the quadrilateral.



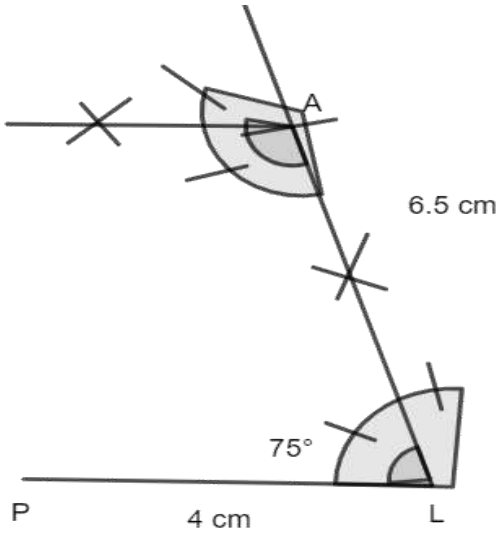
(2) Draw a line segment PL=4 cm



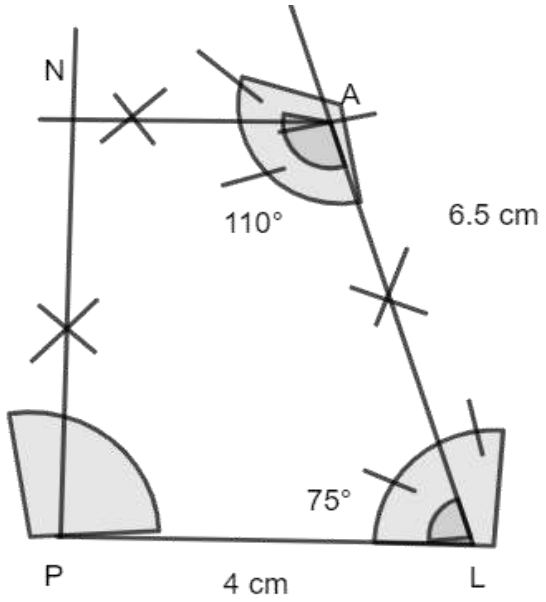

(3) Draw an angle $\angle L = 75^{\circ}$ at the point L. As vertex R is 6.5 cm away from the vertex L, cut a line segment LA=6.5 cm from this ray.




(3) Draw an angel $\angle A = 110^{\circ}$



(4) Draw an angle of $\angle P = 90^\circ$




Thus PLAN is the required quadrilateral.

**(iii) Parallelogram HEAR**

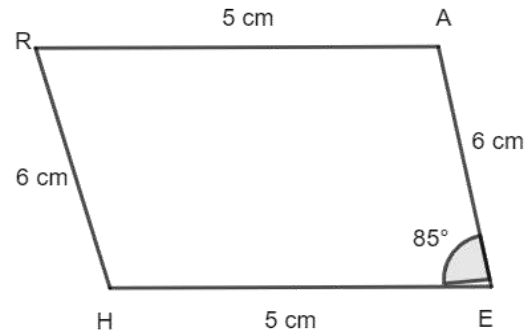
**HE=5 cm**

**EA=6 cm**

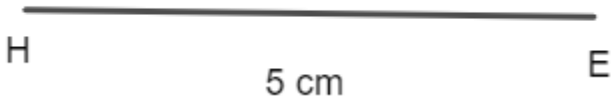
**$\angle R = 85^\circ$**

**Ans:**

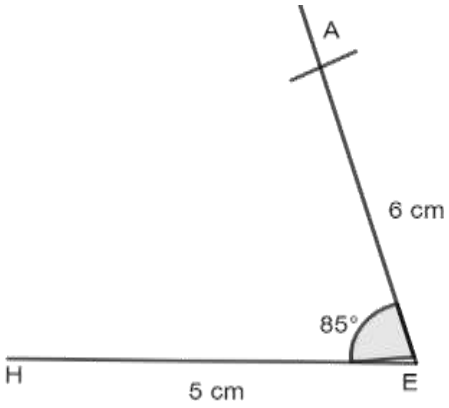
(1) Let us first draw the rough diagram of the parallelogram.



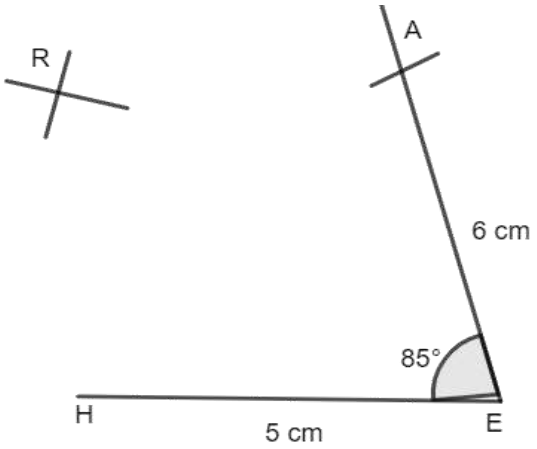
(2) Draw a line segment HE=5 cm



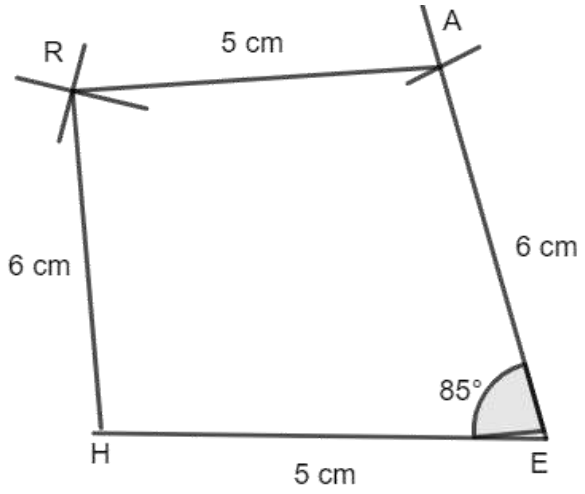

(3) Draw an angle $\angle E = 85^{\circ}$ at the point E. As vertex A is 6 cm away from the vertex E, cut a line segment EA=6 cm from this ray.




(3) Vertex R is 6 cm away from H and 4 cm away from A. With H and A as centers, draw an arc of radius 6 cm and 5 cm respectively. And these will intersect at the point R.



(4) Join AR and HR




Thus HEAR is the required parallelogram.

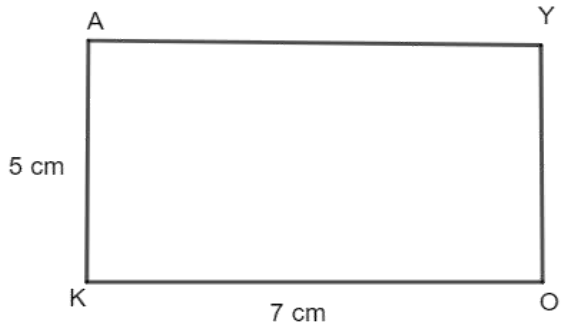
**(iv) Rectangle OKAY**

**OK=7 cm**

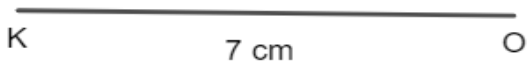
**KA=5 cm**

**Ans:**

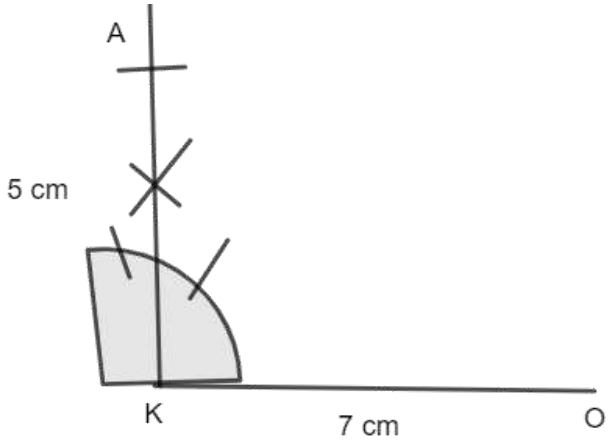
(1) Let us first draw the rough diagram of the rectangle.



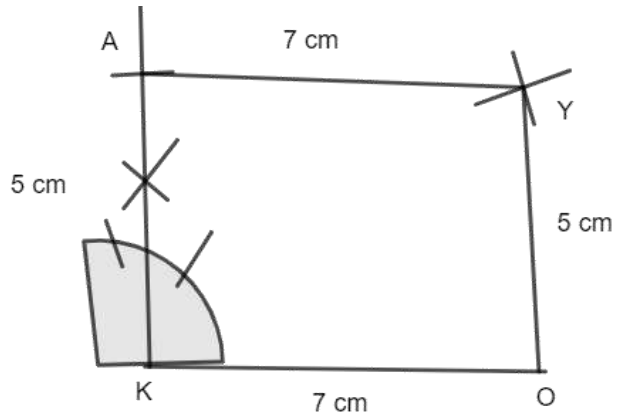

(2) Draw a line segment OK=7 cm



(3) Draw an angle $\angle K = 90^{\circ}$ at the point $K$. As vertex $A$ is $5$ cm away from the vertex $K$, cut a line segment $KA=5$ cm from this ray.




(3) Vertex $Y$ is $5$ cm and $7$ cm away from $O$, $A$ respectively. Draw arcs from $O$, $A$ respectively with the radius of $5$ cm, $7$ cm respectively.




Thus $OKAY$ is the required rectangle.

**Exercise 4.4**

**1. Construct the following quadrilaterals.**

**(i) Quadrilateral DEAR**

**DE=4 cm**

**EA=5 cm**

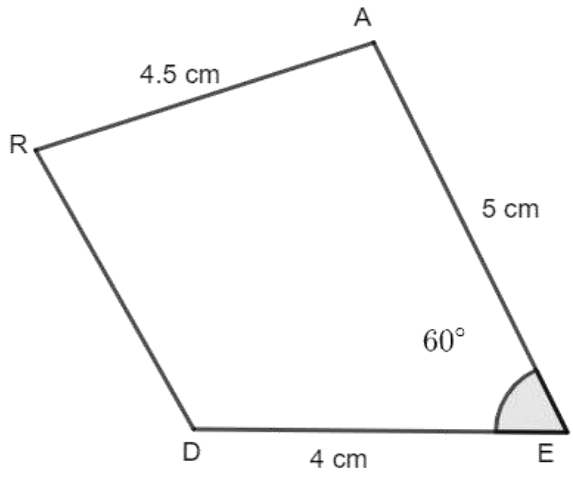
**AR=4.5 cm**

$\angle \mathbf{E} = \mathbf{60}^{\circ}$

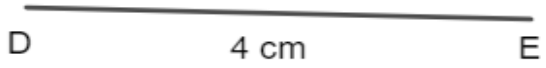
$\angle \mathbf{A} = \mathbf{90}^{\circ}$

**Ans:**

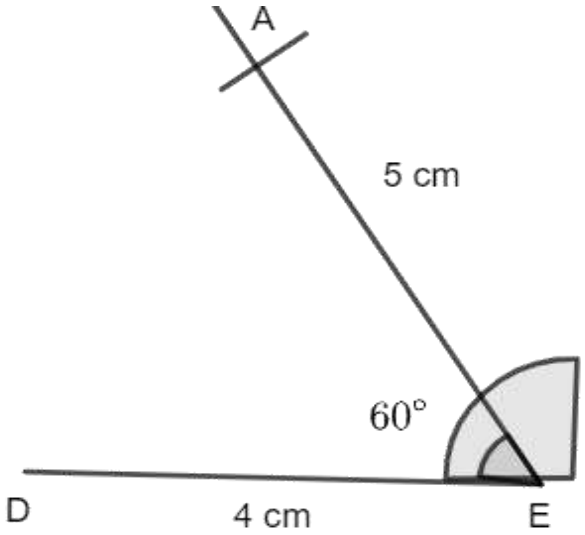
(1) Let us first draw the rough diagram of the quadrilateral.



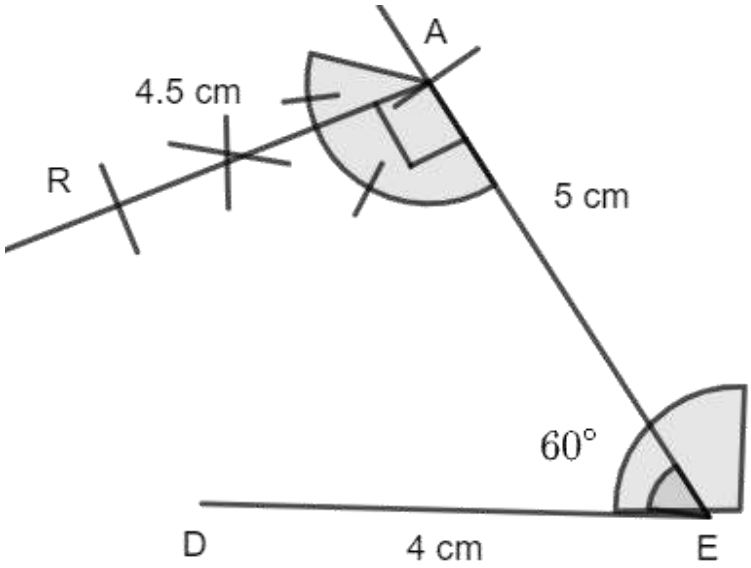

(2) Draw a line segment DE=4 cm



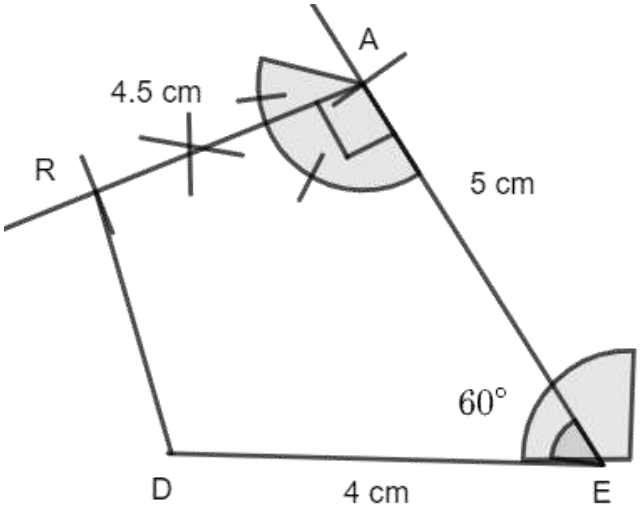

(3) Draw an angle $\angle E = 60^{\circ}$. As vertex R is 4.5 cm away from the vertex A, cut a line segment AR=4.5 cm from this ray.



(3) Draw an angle $\angle A = 90°$. As vertex R is 4.5 cm away from vertex A, draw a line segment AR=4.5 cm from the ray.




(4) Join DR




Thus DEAR is the required quadrilateral.

**(ii) Quadrilateral TRUE**

**TR=3.5 cm**

**RU=3 cm**

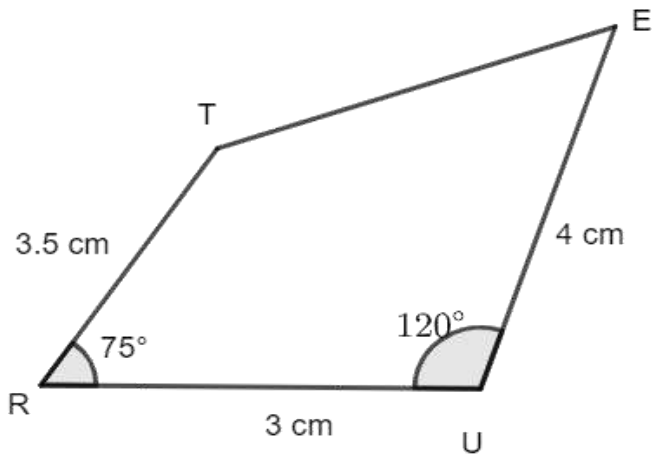
**UE=4 cm**

**$\angle R = 75^{\circ}$**

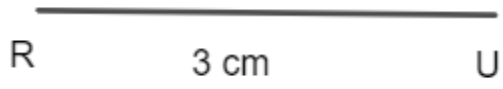
**$\angle U = 120^{\circ}$**

**Ans:**

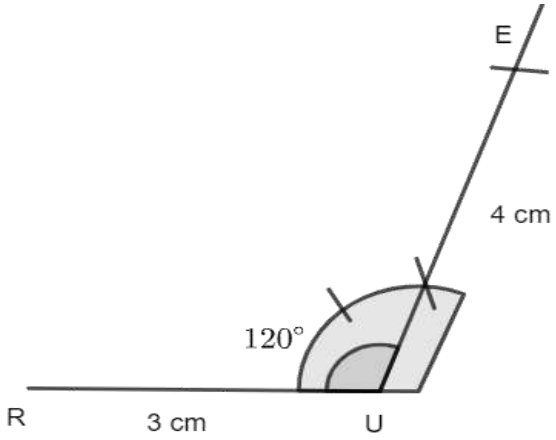
(1) Let us first draw the rough diagram of the quadrilateral.



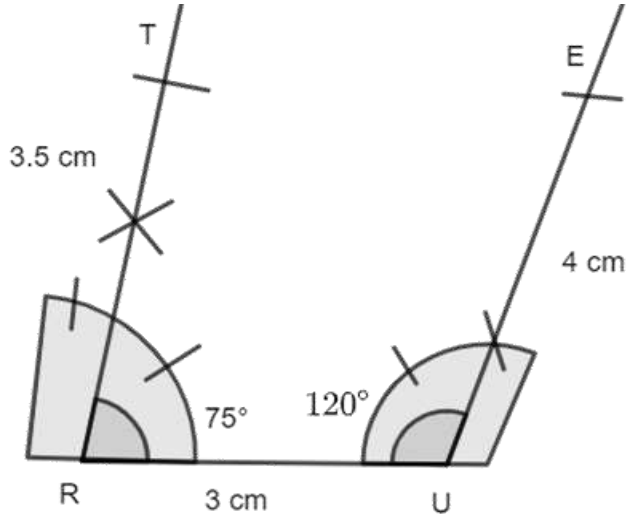

(2) Draw a line segment RU=3 cm



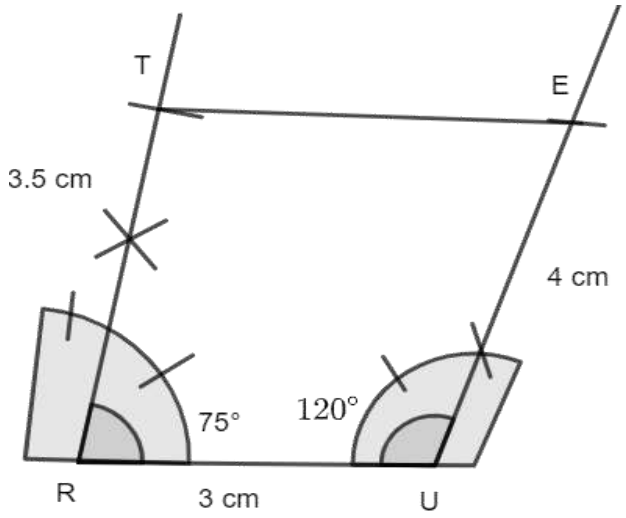

(3) Draw an angle $\angle U = 120^{\circ}$. As vertex E is 4 cm away from the vertex U, cut a line segment EU=4 cm from this ray.




(3) Draw an angle $\angle R = 75°$ As vertex $T$ is $3.5\ cm$ away from the vertex $R$, cut a line segment $RT=3.5\ cm$ from this ray.



(4) Join ET




Thus TRUE is the required quadrilateral.

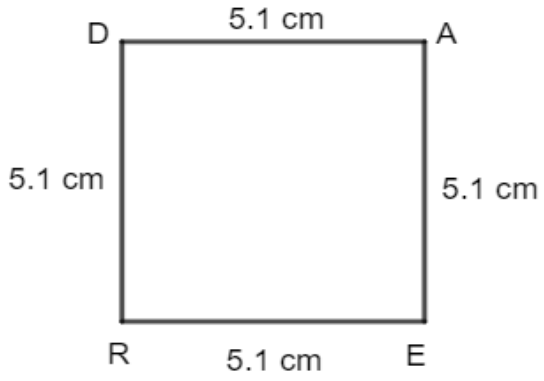
**Exercise 4.5**

**1. Draw the following:**

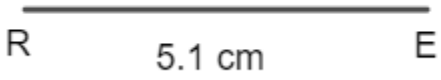
**The square READ with RE=5.1 cm.**

**Ans:** All sides of a square are of same measures and all angles of a square are of $90^\circ$. Therefore the given square can be drawn as follows:

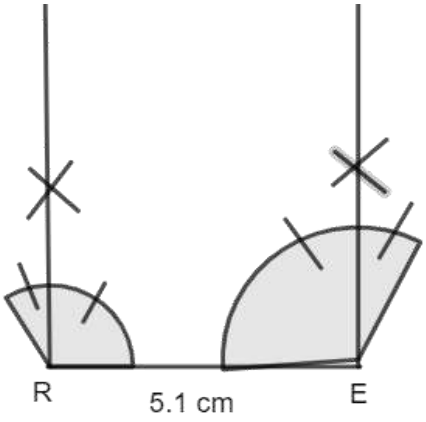
(1) Let us first draw the rough diagram of the square.



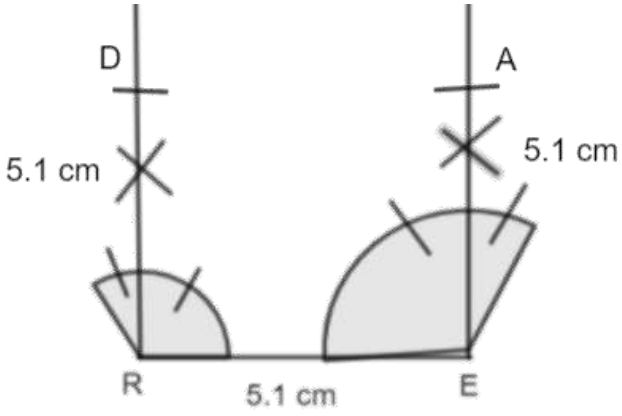
(2) Draw a line segment RE=5.1 cm



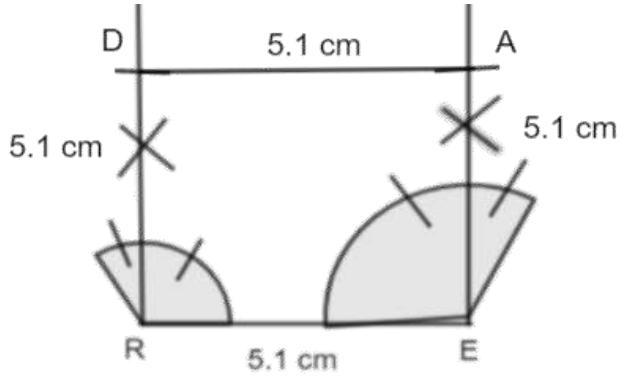

(3) Draw an angle at the point R and E each with an angle 90°




(3) Draw an arc with the radius of 5.1 cm from R and E.



(4) Join AD



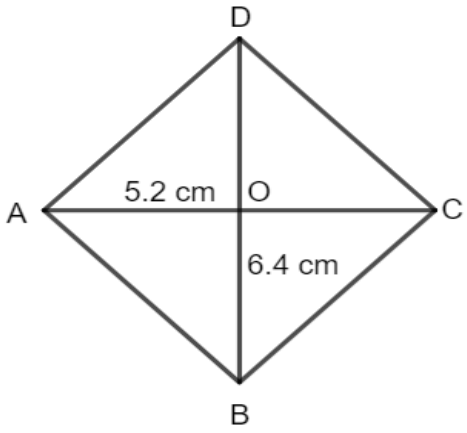

Thus READ is the required Square

**2. Draw the following:**

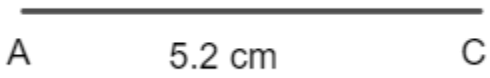
**A rhombus whose diagonals are 5.2 cm and 6.4 cm long.**

**Ans:** In a rhombus diagonals bisect each other at $90^\circ$. Therefore the given rhombus ABCD can be drawn as follows:

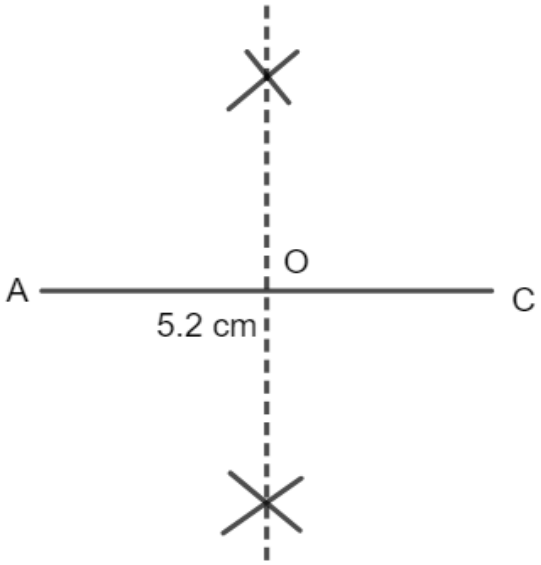
(1) Let us first draw the rough diagram of the rhombus.



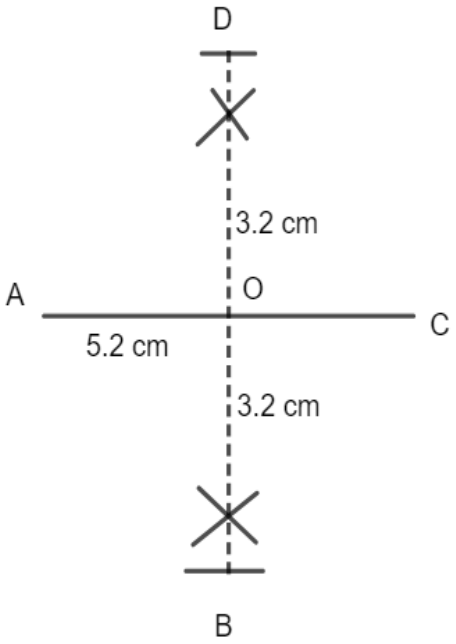

(2) Draw a line segment RU=3 cm



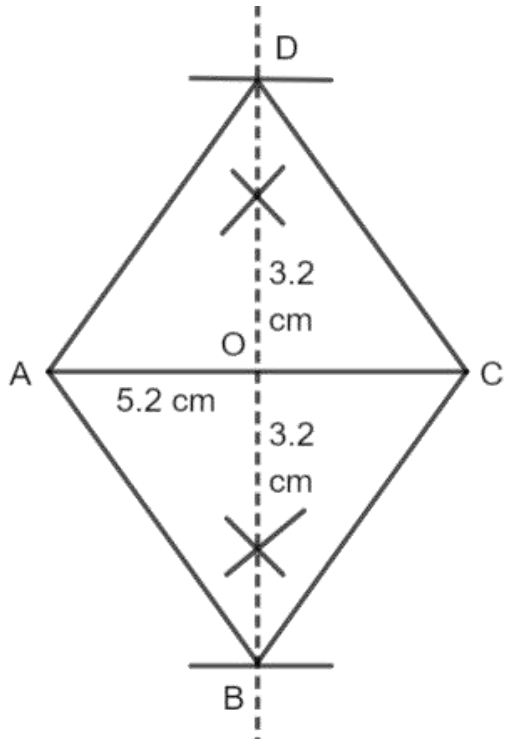

(3) Draw the perpendicular bisector of AC and let it bisect at O




(3) Draw arcs of $3.2$ cm on both the sides of the perpendicular bisector. Let the arcs intersect the perpendicular bisector at $B$ and $D$.



(4) Join $AB$, $AC$, $AD$ and $CD$.



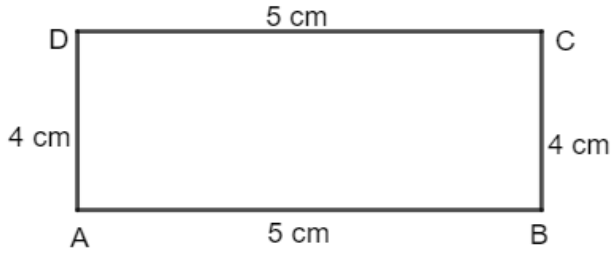

Thus $ABCD$ is the required rhombus.

**3. Draw the following:**

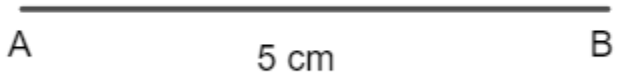
**A rectangle with adjacent sides of length 5 cm and 4 cm**

**Ans:** Opposite sides of the triangle are always equal. And all angles of the rectangle are of measure $90°$. The rectangle $ABCD$ can be drawn as follows:

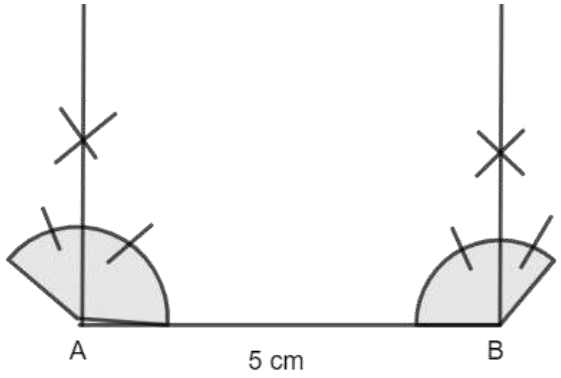
(1) Let us first draw the rough diagram of the rectangle.



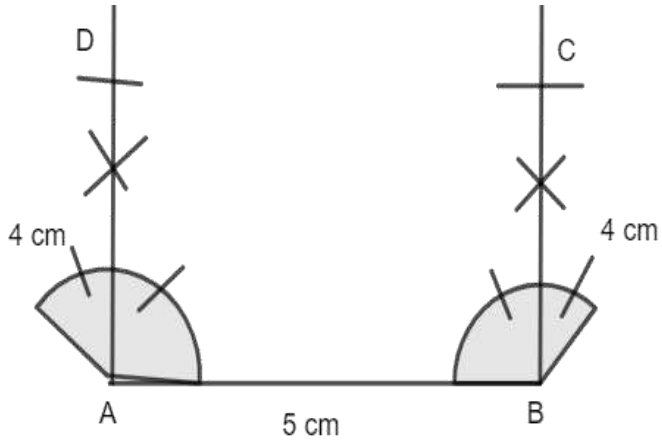
(2) Draw a line segment $AB=5$ cm



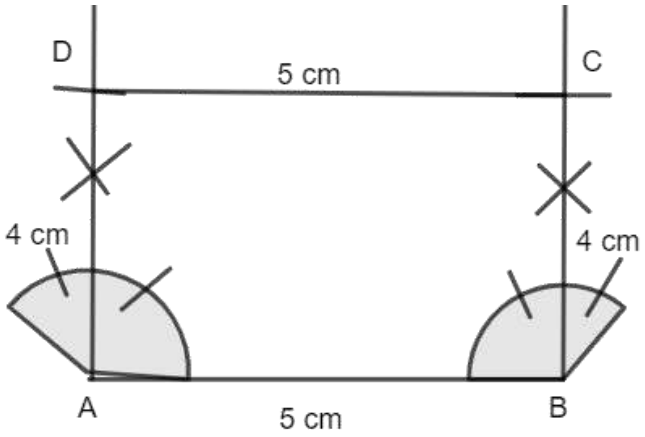

(3) Draw an angle $\angle A = 90^{\circ}$ and $\angle B = 90^{\circ}$ and draw a ray from both th points.




(4) Draw an arc from $A$ and $B$ with the radius of $4$ cm



(5) Join CD

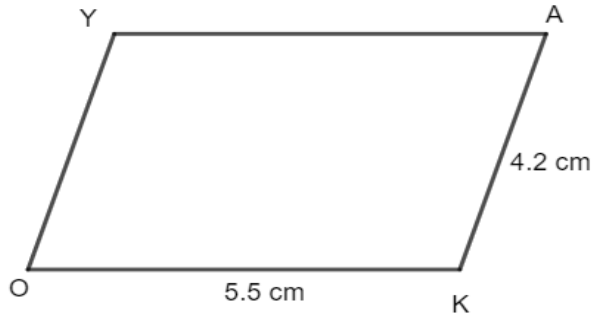



Thus ABCD is the required rectangle.

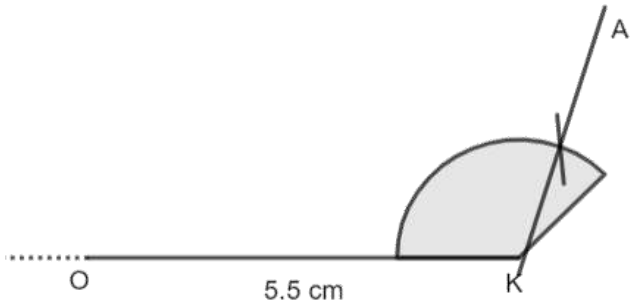
**4. A parallelogram OKAY where OK= 5.5 cm and KA= 4.2 cm.**

**Ans:** Opposite sides of the parallelogram are equal and parallel to each other. The given parallelogram can be drawn as follows:

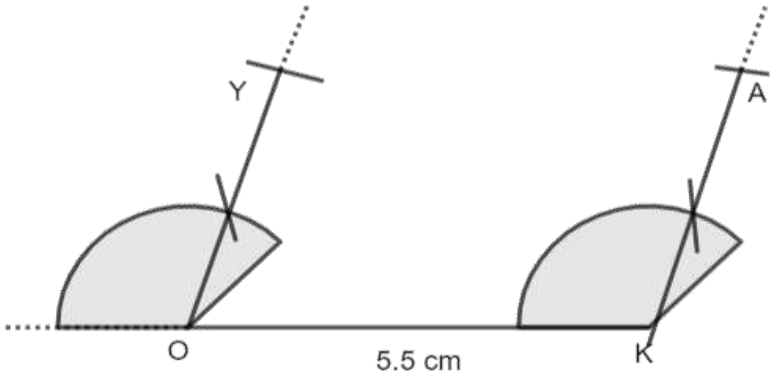
(1) The rough sketch of the parallelogram OKAY is drawn as follows:




(2) Draw a line segment OK=5.5 cm and a ray at a point in a convenient angle.



(3) Draw a ray at a point $O$ parallel to the ray at $K$. As the vertices $A$ and $Y$ are $4.2$ cm away from the vertices $K$ and $O$ respectively, cut the line segment $KA, OY$ each of $4.2$ cm from these rays.




(4) Join $AY$.