

## CBSE NCERT Solutions for Class 8 Mathematics Chapter 4

### Back of Chapter Questions

1. Construct the following quadrilaterals.

(i) Quadrilateral ABCD

$$AB = 4.5 \text{ cm}$$

$$BC = 5.5 \text{ cm}$$

$$CD = 4 \text{ cm}$$

$$AD = 6 \text{ cm}$$

$$AC = 7 \text{ cm}$$

(ii) Quadrilateral JUMP

$$JU = 3.5 \text{ cm}$$

$$UM = 4 \text{ cm}$$

$$MP = 5 \text{ cm}$$

$$PJ = 4.5 \text{ cm}$$

$$PU = 6.5 \text{ cm}$$

(iii) Parallelogram MORE

$$OR = 6 \text{ cm}$$

$$RE = 4.5 \text{ cm}$$

$$EO = 7.5 \text{ cm}$$

(iv) Rhombus BEST

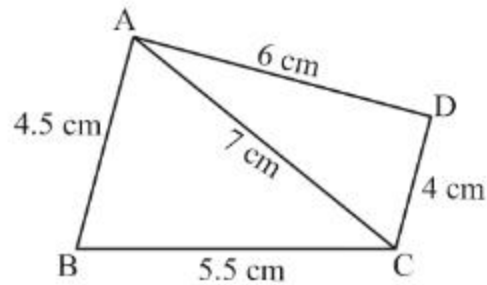
$$BE = 4.5 \text{ cm}$$

$$ET = 6 \text{ cm}$$

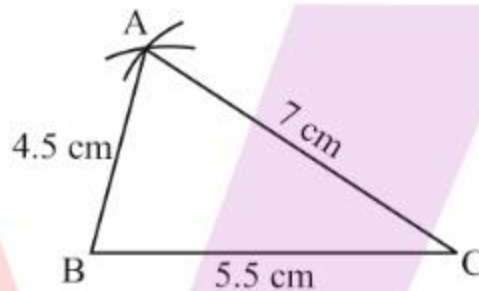
**Solution:**

(i) Given,  $AB = 4.5 \text{ cm}$ ,  $BC = 5.5 \text{ cm}$ ,  $CD = 4 \text{ cm}$ ,  $AD = 6 \text{ cm}$  and  $AC = 7 \text{ cm}$

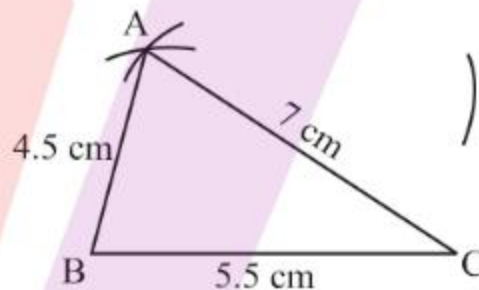
(a) Draw a rough sketch which will help us to visualize the quadrilateral. We draw this first and mark measurements:



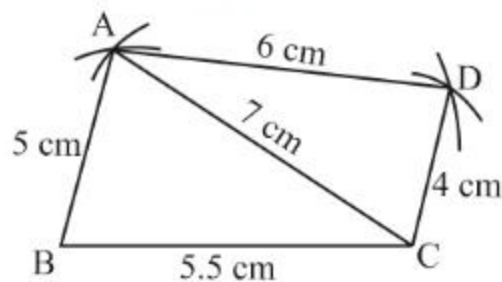
- (b) Draw  $BC = 5.5$  cm. Now with  $B$  as the center draw an arc of  $4.5$  cm and with  $C$  as the center draw an arc of  $7$  cm. Mark the point of intersection as  $A$ .



- (c) Given that  $AD$  is  $6$  cm, draw an arc of radius  $6$  cm from point  $A$  as the center.



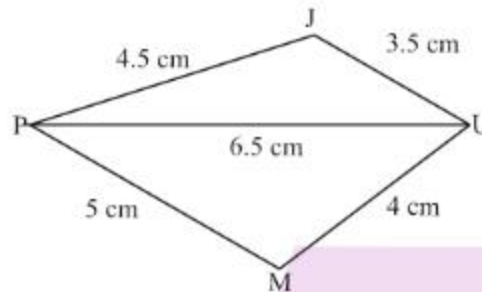
- (d) Now with  $C$  as the center draw an arc of radius  $4$  cm such that it cuts the previous arc. Call this point of intersection as  $D$ .



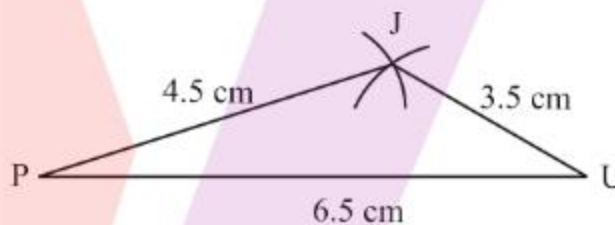
Hence,  $ABCD$  is the required quadrilateral.

(ii) Given,  $JU = 3.5$  cm,  $UM = 4$  cm,  $MP = 5$  cm,  $PJ = 4.5$  cm and  $PU = 6.5$  cm

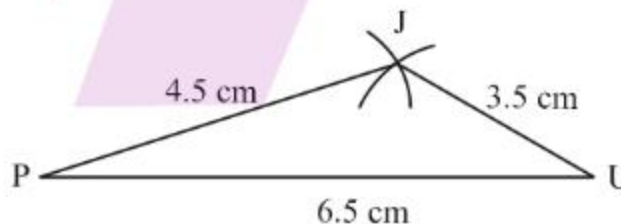
(a) Draw a rough sketch which will help us to visualize the quadrilateral. We draw this first and mark measurements



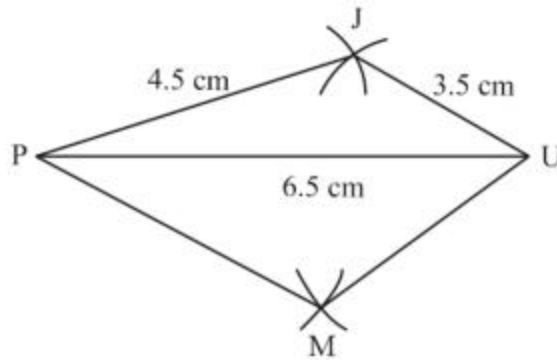
(b) Draw the base line  $PU = 6.5$  cm. Now with P as the center draw an arc of radius 4.5 cm and with U as the center draw an arc of radius 3.5 cm such that it cuts the previously drawn arc. Name this point of intersection as J.



(c) Given that the point M is at a distance of 4 cm and 5 cm from U and P respectively, draw arcs of radius 4 cm and 5 cm from U and P. The point of intersection is M.



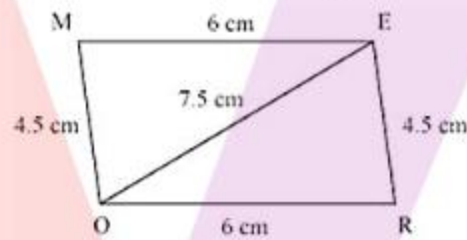
(d) Join PM and UM



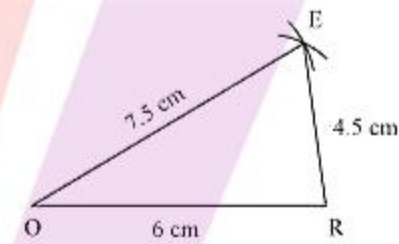
JUMP is the required quadrilateral.

(iii) Given,  $OR = 6\text{ cm}$ ,  $RE = 4.5\text{ cm}$  and  $EO = 7.5\text{ cm}$

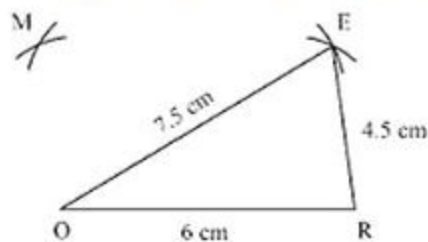
- (a) The opposite sides of a parallelogram are equal and parallel. Therefore,  $ME = OR$  and  $MO = ER$ . Draw a rough sketch which will help us to visualize the parallelogram:



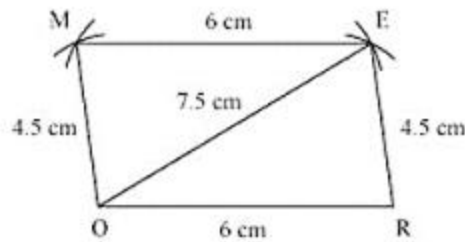
- (b) Construct  $OR = 6\text{ cm}$ . Now with  $O$  and  $R$  as centers draw arcs of radius  $7.5\text{ cm}$  and  $4.5\text{ cm}$  respectively. Name the point of intersection as  $E$ .



- (c) Construct arcs of radius  $4.5\text{ cm}$  and  $6\text{ cm}$  from  $O$  and  $E$  respectively. The point of intersection is named as  $M$ .



- (d) Join  $OM$  and  $EM$

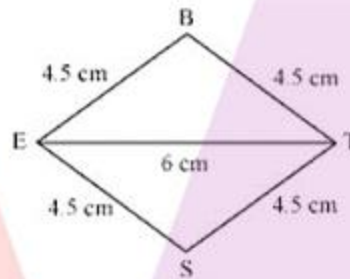


Therefore, MORE is the required parallelogram.

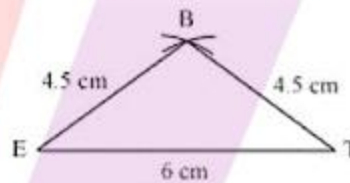
(iv) Given,  $BE = 4.5$  cm and  $ET = 6$  cm

(a) Since all the sides of a rhombus measure the same,  $BE = ES = ST = TB$ .

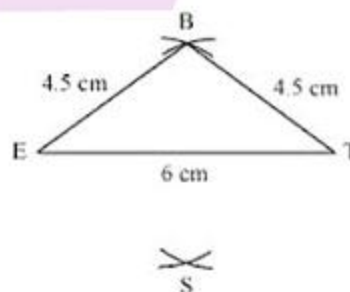
Draw a rough sketch which will help us to visualize the rhombus.



(b) Construct  $ET = 6$  cm. Now with E and T as the centers construct arcs of radius 4.5 cm from each respectively. The point of intersection is named as B.

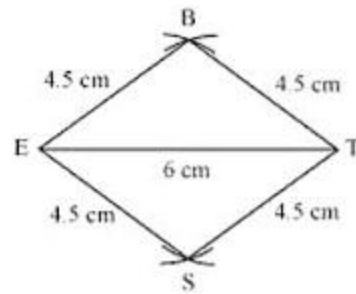


(c) Since point S is 4.5 cm away from E and T respectively, construct arcs of 4.5 cm from E and T and the point of intersection gives S.



(d) Join ES and TS





Hence, 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

(ii) Quadrilateral GOLD

OL = 7.5 cm

GL = 6 cm

GD = 6 cm

LD = 5 cm

OD = 10 cm

(iii) Rhombus BEND

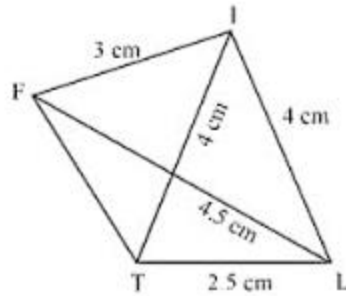
BN = 5.6 cm

DE = 6.5 cm

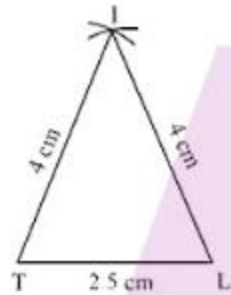
**Solution:**

(i) Given, LI = 4 cm, IF = 3 cm, TL = 2.5 cm, LF = 4.5 cm and IT = 4 cm

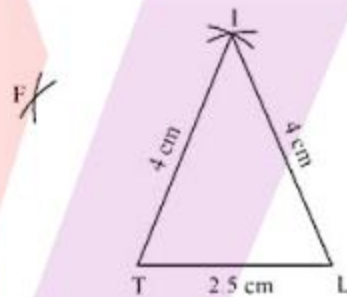
(a) Draw the rough sketch of the quadrilateral LIFT. Now we can easily see that it is possible to draw  $\Delta LTI$  first.



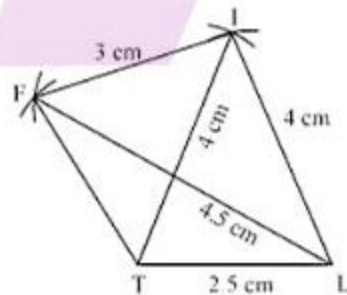
- (b) Draw  $\Delta LTI$  using SSS construction. So  $\Delta LTI$  is constructed with the given measurements as shown.



- (c) Construct arcs of radius 4.5 cm and 3 cm with centers L and I respectively. The point of intersection is F.



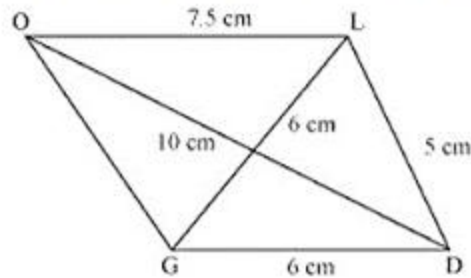
- (d) Join FT and IF to obtain the required quadrilateral.



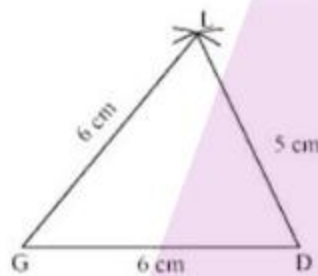
Hence, LIFT is the required quadrilateral.

- (ii) Given,  $OL = 7.5$  cm,  $GL = 6$  cm,  $GD = 6$  cm,  $LD = 5$  cm and  $OD = 10$  cm

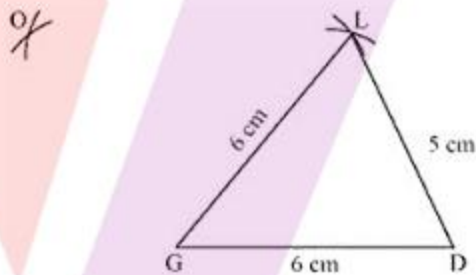
- (a) Draw the rough sketch of the quadrilateral LIFT. Now we can easily see that it is possible to draw  $\Delta DGL$  first.



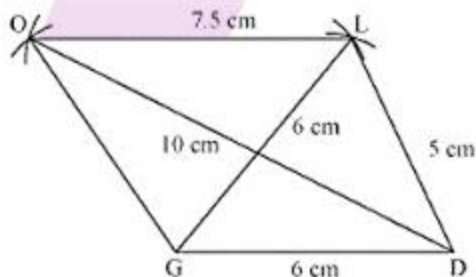
- (b) Draw  $\Delta DGL$  using SSS construction. So  $\Delta DGL$  is constructed with the given measurements as shown.



- (c) With D and L as the centers construct arcs of 10 cm and 7.5 cm respectively. The point of intersection is named as O.



- (d) Join O to G, D and L to obtain the required quadrilateral.

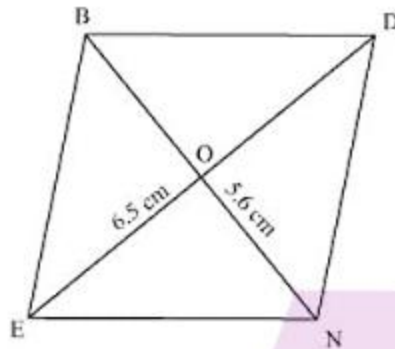


Therefore, GOLD is the required quadrilateral.

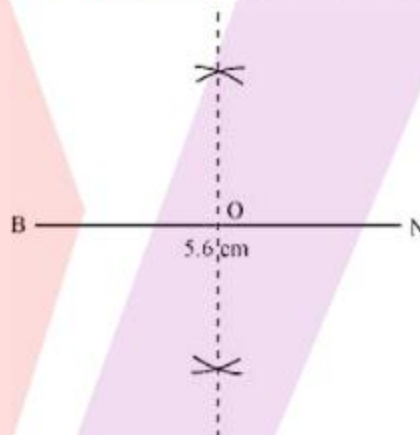
- (iii) Given,  $BN = 5.6$  cm and  $DE = 6.5$  cm



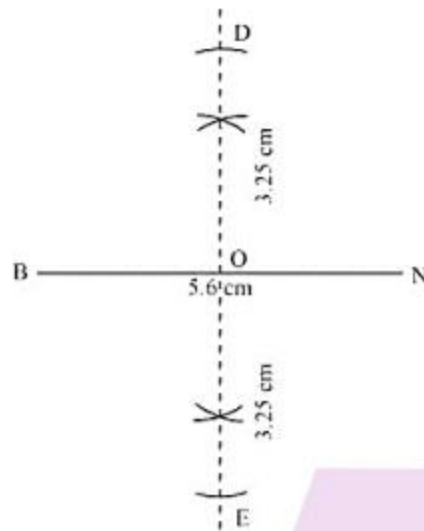
- (a) The diagonals of a rhombus bisect each other at  $90^\circ$ . Let us assume  $O$  to be the point of intersection. Then  $EO = OD = 3.25\text{cm}$ . the rough sketch is as shown below:



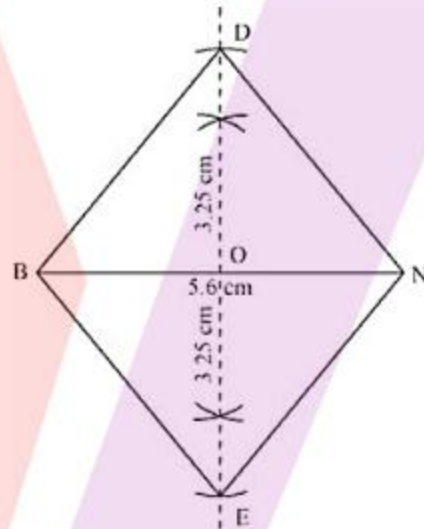
- (b) Draw  $BN = 5.6\text{ cm}$  and construct its perpendicular bisectors. Name the point at which it intersects  $BN$  to be  $O$ .



- (c) With  $O$  as the center draw arcs of  $3.25\text{ cm}$  such that they intersect the perpendicular bisector at point  $D$  and  $E$  respectively.



(d) Join BD, DN, BE and EN to obtain the required rhombus BEND.



Hence, the above figure is the required rhombus.

### EXERCISE 4.3

1. Construct the following quadrilaterals.

(i) Quadrilateral MORE

$$MO = 6 \text{ cm}$$

$$OR = 4.5 \text{ cm}$$

$$\angle M = 60^\circ$$

$$\angle O = 105^\circ$$

$$\angle R = 105^\circ$$

(ii) Quadrilateral PLAN

- $PL = 4 \text{ cm}$   
 $LA = 6.5 \text{ cm}$   
 $\angle P = 90^\circ$   
 $\angle A = 110^\circ$   
 $\angle N = 85^\circ$

(iii) Parallelogram HEAR

- $\angle R = 85^\circ$   
 $EA = 6 \text{ cm}$

$HE = 5 \text{ cm}$

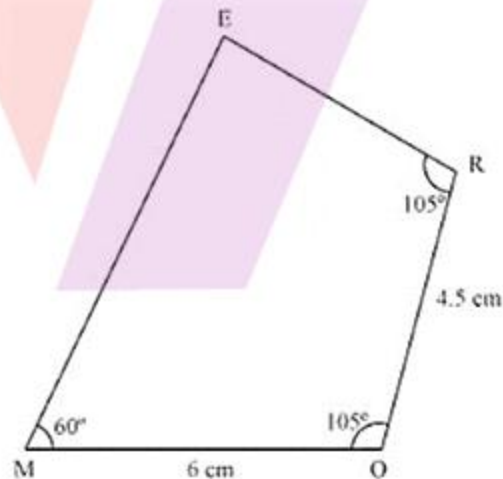
(iv) Rectangle OKAY

- $OK = 7 \text{ cm}$   
 $KA = 5 \text{ cm}$

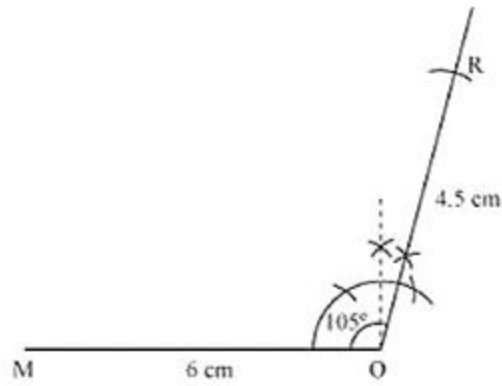
**Solution:**

(i) Given,  $MO = 6 \text{ cm}$ ,  $OR = 4.5 \text{ cm}$ ,  $\angle M = 60^\circ$ ,  $\angle O = 105^\circ$  and  $\angle R = 105^\circ$

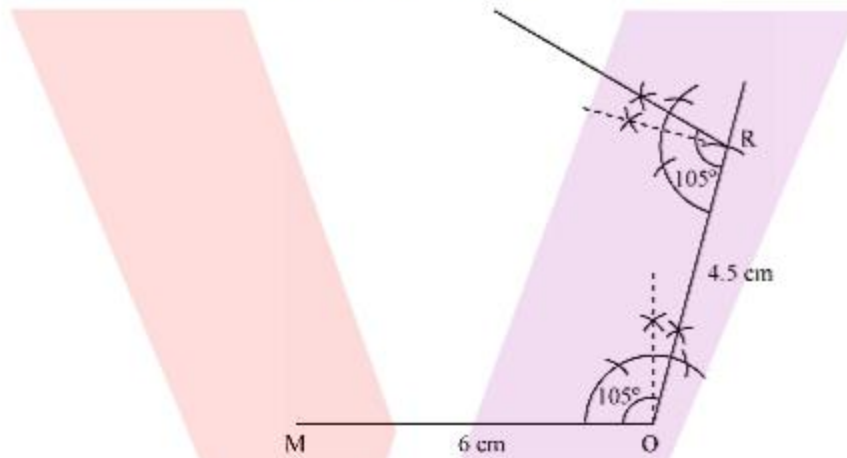
(a) Draw a rough sketch which will help us to visualize the quadrilateral.



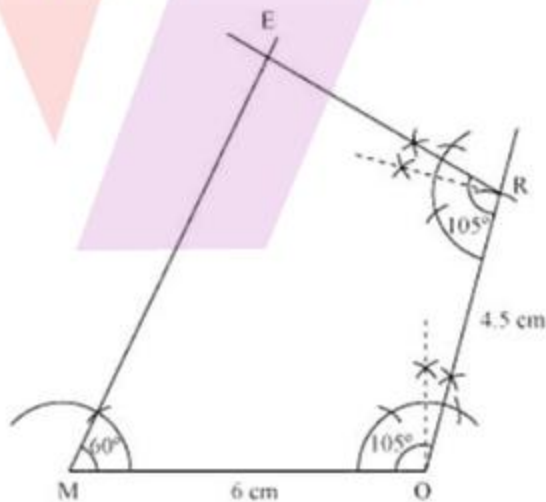
(b) Start with taking  $MO = 6 \text{ cm}$  on  $O$  and a line segment of  $105^\circ$  degrees from  $O$ . Given that  $OR = 4.5 \text{ cm}$ , cut an arc of  $4.5 \text{ cm}$  and locate  $R$  with  $O$  as the center.



(c) Draw an angle of  $105^\circ$  from R and draw a line.



(d) Draw a ray of  $60^\circ$  from M and extend it to meet the ray starting from R. The point of intersection gives E.



Hence, MORE is the required quadrilateral.

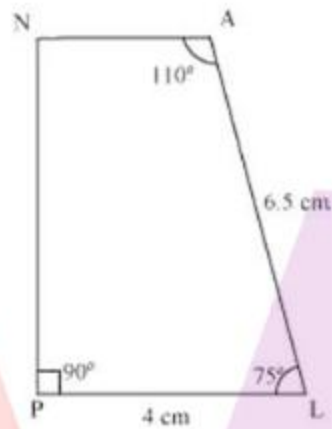
(ii) Given,  $PL = 4\text{ cm}$ ,  $LA = 6.5\text{ cm}$ ,  $\angle P = 90^\circ$ ,  $\angle A = 110^\circ$  and  $\angle N = 85^\circ$

Using angle sum property of a quadrilateral,

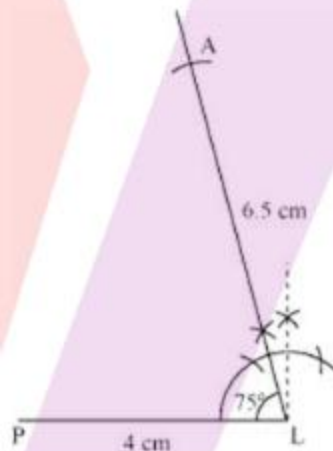
$$\angle P + \angle L + \angle A + \angle N = 360^\circ$$

Which gives  $\angle L = 75^\circ$

- (a) Draw a rough sketch which will help us to visualize the quadrilateral.

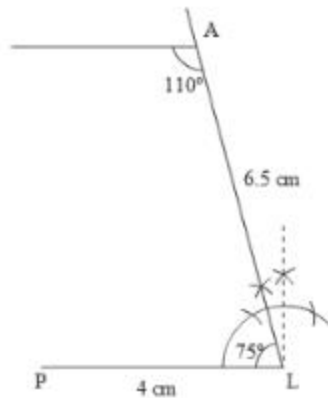


- (b) Draw  $PL = 4\text{ cm}$  and construct an angle of  $75^\circ$  from point  $L$ . Cut an arc of  $6.5\text{ cm}$  on the ray and name the point as  $A$ .

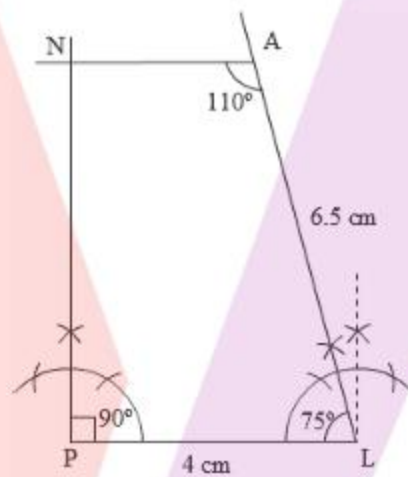


- (c) Draw an angle of  $110$  degrees at point  $A$  and draw a line.





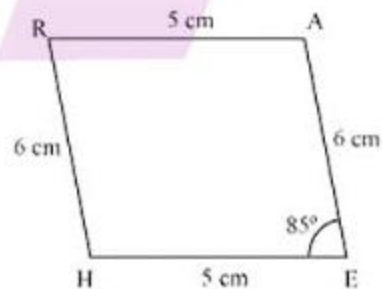
- (d) Draw a ray at an angle of  $90^\circ$  from P and let it meet the ray from A at N



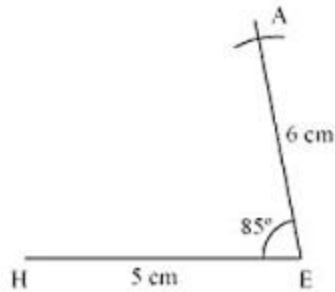
Hence, PLAN is the required quadrilateral.

- (iii) Given,  $\angle R = 85^\circ$ ,  $EA = 6$  cm and  $HE = 5$  cm

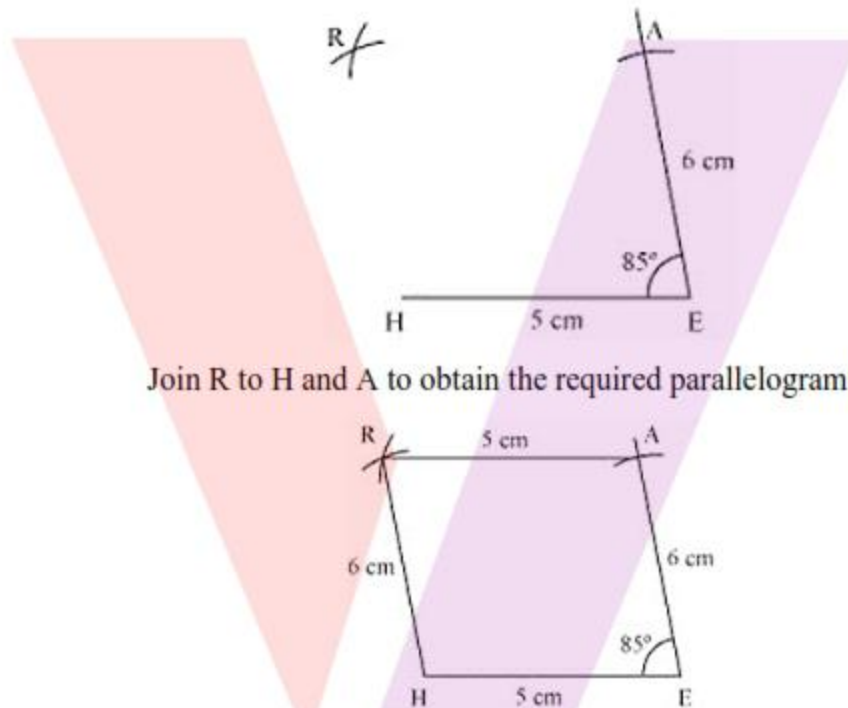
- (a) Draw a rough sketch which will help us to visualize the parallelogram.



- (b) Construct  $HE = 5$  cm and an angle of  $85^\circ$  at E. Since AE is given to be 6 cm, cut an arc of 6 cm on the ray from E and the point obtained will be named as A.



- (c) Draw arcs of radius 6 cm and 5 cm from H and A respectively. Name the point of intersection as R



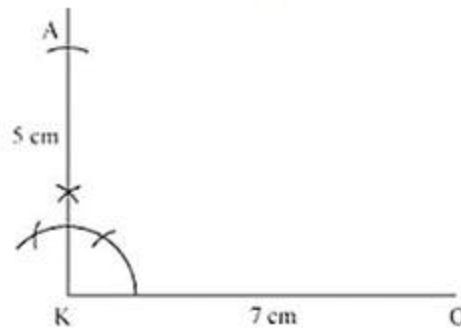
Join R to H and A to obtain the required parallelogram HEAR.

Hence, the above figure is the required parallelogram.

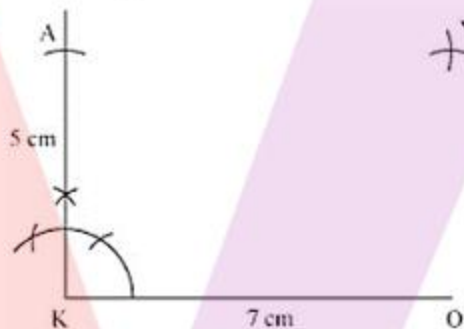
- (iv) Given,  $OK = 7$  cm and  $KA = 5$  cm
- (a) Draw a rough sketch which will help us to visualize the rectangle OKAY.



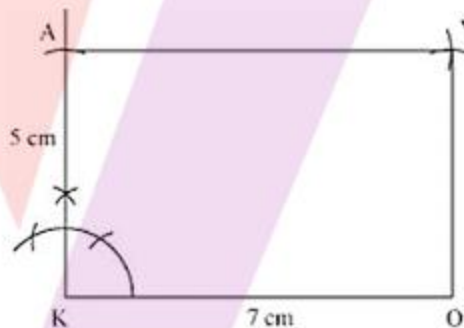
- (b) Draw  $KO = 7\text{ cm}$  and an angle of  $90^\circ$  at  $K$ . Given that  $AK$  is  $5\text{ cm}$ , cut an arc of  $5\text{ cm}$  on the ray drawn from  $K$  and name the point  $A$ .



- (c) Draw arcs of radius  $5\text{ cm}$  and  $7\text{ cm}$  from  $O$  and  $A$  respectively. The point of intersection gives  $Y$



Join  $AY$  and  $OY$  to obtain the required rectangle  $OKAY$ .



Therefore, the above figure is the required rectangle.

#### EXERCISE 4.4

1. Construct the following quadrilaterals.

- (i) Quadrilateral DEAR

$$DE = 4\text{ cm}$$

$$EA = 5\text{ cm}$$

$$AR = 4.5\text{ cm}$$

$$\angle E = 60^\circ$$

$$\angle A = 90^\circ$$

(ii) Quadrilateral TRUE

$$TR = 3.5 \text{ cm}$$

$$RU = 3 \text{ cm}$$

$$UE = 4 \text{ cm}$$

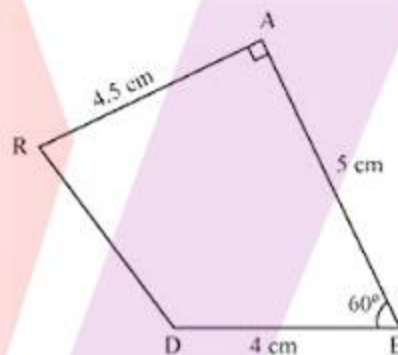
$$\angle R = 75^\circ$$

$$\angle U = 120^\circ$$

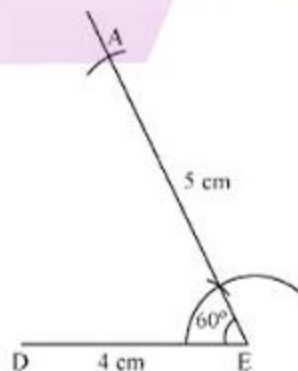
**Solution:**

(i) Given,  $DE = 4 \text{ cm}$ ,  $EA = 5 \text{ cm}$ ,  $AR = 4.5 \text{ cm}$ ,  $\angle E = 60^\circ$  and  $\angle A = 90^\circ$

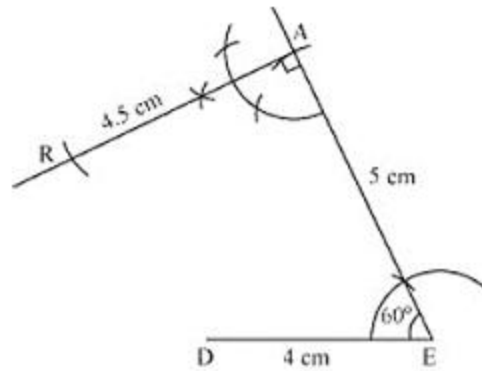
(a) Draw a rough sketch which will help us to visualize the quadrilateral DEAR.



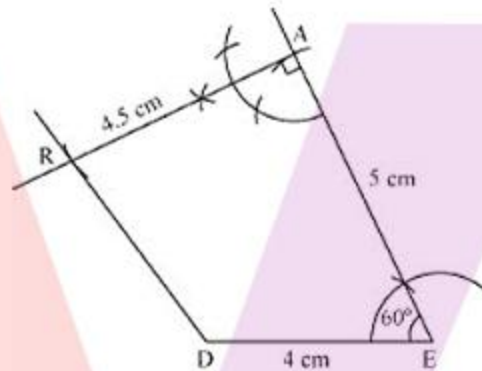
(b) Draw  $DE = 4 \text{ cm}$  and an angle of  $60^\circ$  at E. Cut an arc of 5 cm on the ray extended from E and name this point as A.



(c) Draw an angle of  $90^\circ$  at A and cut an arc of 4.5 cm on the ray extended from A. Name this point as R.



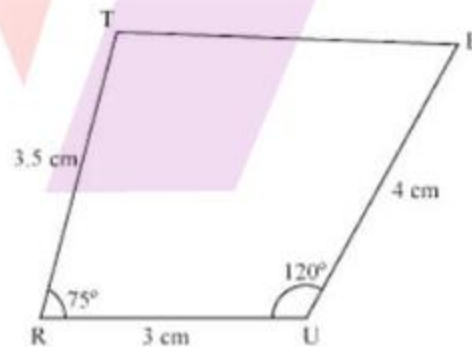
- (d) Join RD to obtain the required quadrilateral DEAR.



Hence, DEAR is the required quadrilateral.

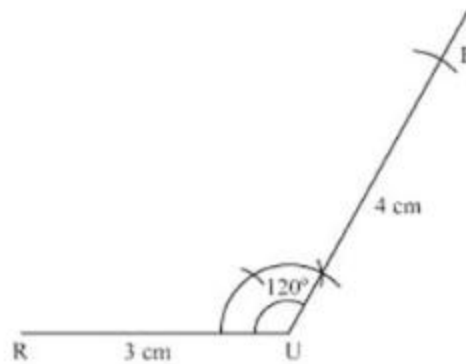
- (ii) Given,  $TR = 3.5$  cm,  $RU = 3$  cm,  $UE = 4$  cm,  $\angle R = 75^\circ$  and  $\angle U = 120^\circ$

- (a) Draw a rough sketch which will help us to visualize the quadrilateral TRUE.

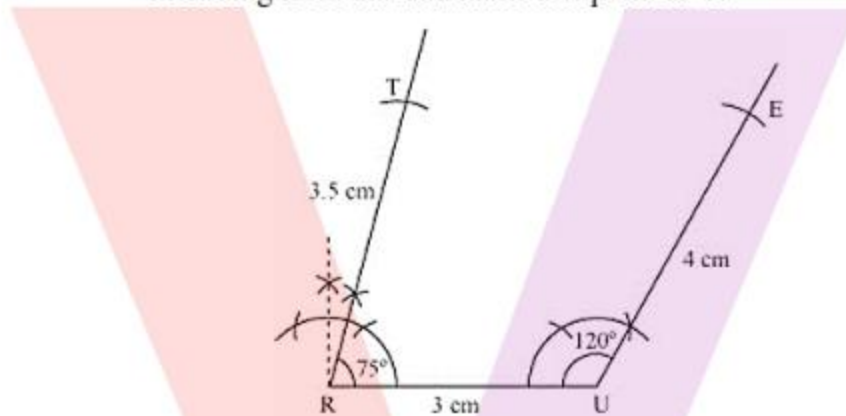


- (b) Draw  $RU = 3$  cm and an angle of  $120^\circ$  at U. Cut an arc of 4 cm on the ray extending from U and name this point as E.

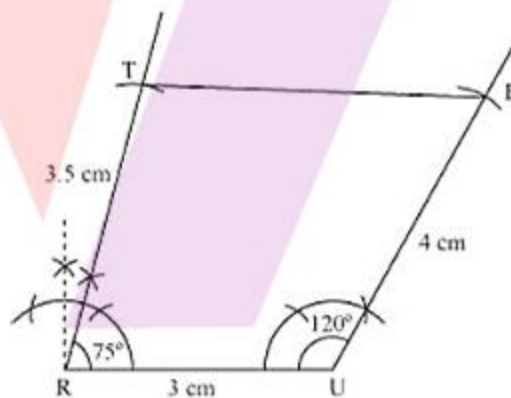




- (c) Next draw an angle of  $75^\circ$  at R and cut an arc of 3.5 cm on the ray extending from this and name this point as T.



- (d) Join TE to obtain the required quadrilateral TRUE.



Hence, the above figure is the required quadrilateral.

#### EXERCISE 4.5

1. Draw the following.
  - (i) The square READ with  $RE = 5.1$  cm.
  - (ii) A rhombus whose diagonals are 5.2 cm and 6.4 cm long.
  - (iii) A rectangle with adjacent sides of lengths 5 cm and 4 cm

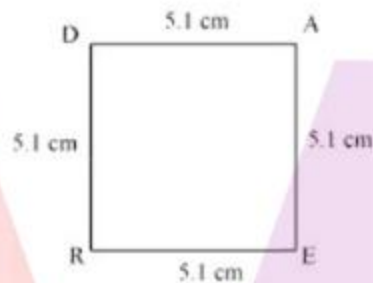
- (iv) A parallelogram OKAY where  $OK = 5.5$  cm and  $KA = 4.2$  cm. Is it unique?

**Solution:**

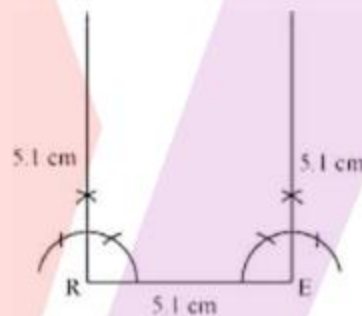
- (i) Given,  $RE = 5.1$  cm

All the sides of a square measure the same and each of the angle measure  $90^\circ$ .

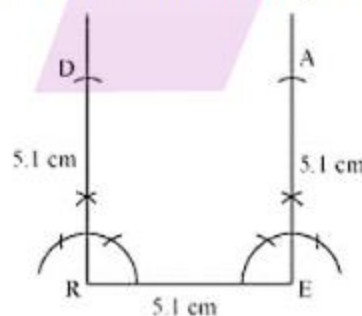
- (a) Draw a rough sketch which will help us to visualize the square read.



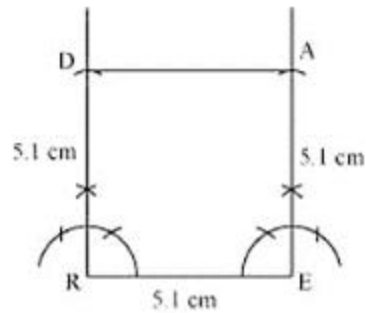
- (b) Draw  $RE = 5.1$  cm and an angle of  $90^\circ$  at R and E respectively.



Cut arcs of 5.1 cm from R and E such that they intersect the ray extending from them at D and A respectively.



Join DA to obtain the required square READ.

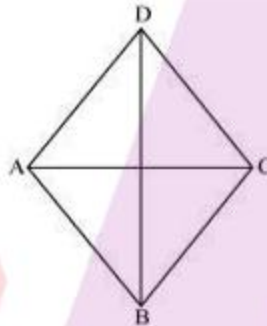


Hence, the above figure is the required square.

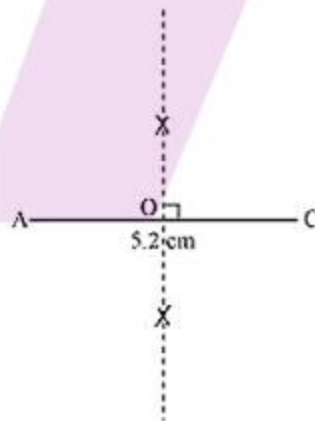
- (ii) Given, diagonals are 5.2 cm and 6.4 cm long

In a rhombus, the diagonals bisect each other at  $90^\circ$ .

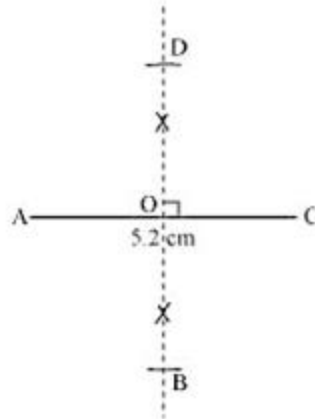
- (a) Draw a rough sketch which will help us to visualize the rhombus ABCD.



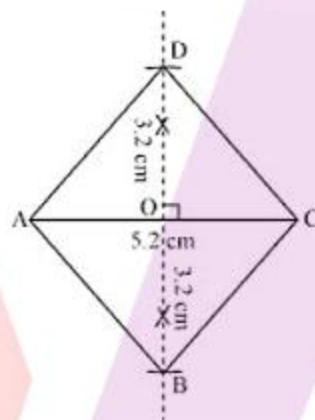
- (b) Draw  $AC = 5.2$  cm and construct the perpendicular bisectors. Let it intersect AC at point O.



- (c) Draw arcs of 3.2 cm on both the sides of this perpendicular bisector and name it D and B as shown.



Join B and D to A and C to obtain the required rhombus ABCD.

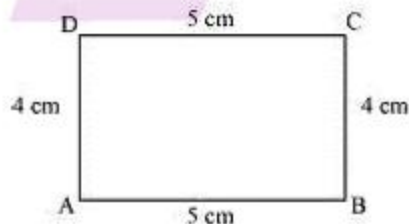


Hence, the above figure is the required rhombus.

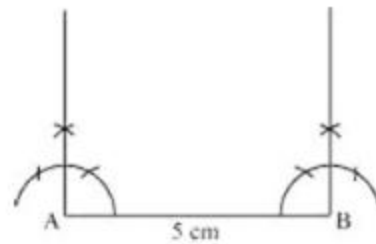
- (iii) Given, adjacent sides of lengths are 5 cm and 4 cm.

In a rectangle, the opposite sides measure the same and each interior angle is equal to  $90^\circ$ .

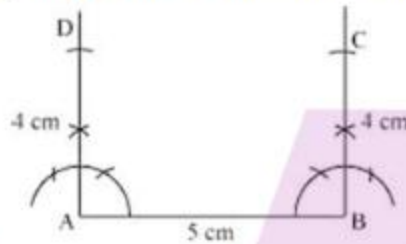
- (a) Draw a rough sketch which will help us to visualize the rectangle ABCD.



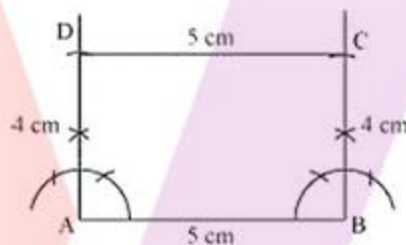
- (b) Draw a line segment AB of 5cm and an angle of  $90^\circ$  at A and B respectively.



- (c) Cut arcs of 4 cm on the rays extending from A and B respectively and name the points of intersection as D and C respectively.



- (d) Join DC.

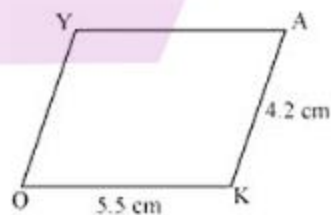


Hence, the above figure is the required rectangle.

- (iv) Given,  $OK = 5.5$  cm and  $KA = 4.2$  cm

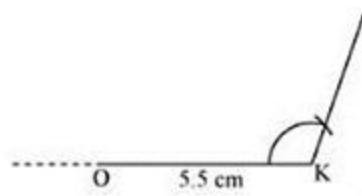
Opposite sides of a parallelogram are equal and parallel to each other.

- (a) Draw a rough sketch which will help us to visualize the parallelogram OKAY.

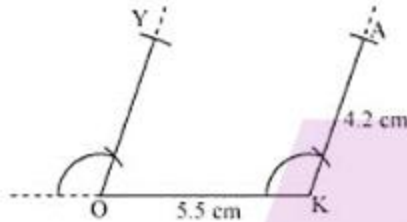


- (b) Draw a line segment OK of 5.5cm and any convenient angle at point A.

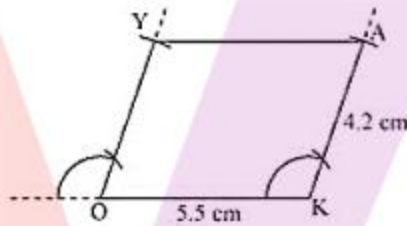




- (c) Draw a ray from O such that it is parallel to the one at K. Cut arcs of 4.2 cm from O and K such that they intersect the rays at Y and A respectively.



Join AY to obtain the required parallelogram OKAY



Hence, the above figure is the required parallelogram.

