

EXERCISE 12.1

1. Let the adjacent sides of the parallelogram be $3x$ cm and $5x$ cm.

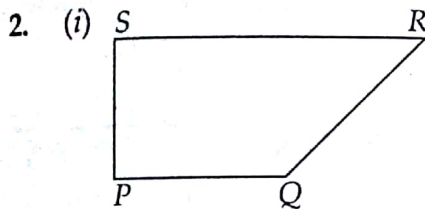
Perimeter of parallelogram = 64 cm (given)
 \therefore Perimeter of parallelogram = Sum of all sides

$$64 = 3x + 5x + 3x + 5x$$

$$\Rightarrow 16x = 64$$

$$\Rightarrow x = \frac{64}{16} \Rightarrow x = 4$$

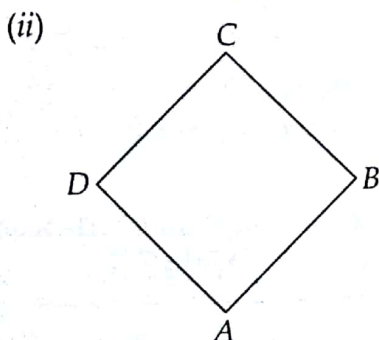
Thus, the adjacent sides of parallelogram are $3 \times 4 = 12$ cm and $5 \times 4 = 20$ cm.



Sides : PQ, QR, RS and SP .

Angles : $\angle QPS, \angle PSR, \angle SRQ, \angle RQP$

Vertices : P, Q, R, S



Sides : AB, BC, CD and DA .

Angles : $\angle DAB, \angle ABC, \angle BCD, \angle CDA$

Vertices : A, B, C, D .

3. Let all four equal angles of the quadrilateral be x .

\therefore The sum of angles of a quadrilateral = 360°

$$\Rightarrow x + x + x + x = 360^\circ$$

$$\Rightarrow 4x = 360^\circ$$

$$\Rightarrow x = \frac{360^\circ}{4} \Rightarrow x = 90^\circ$$

Thus, measure of each angle of quadrilateral is 90° .

4. \therefore The sum of the angles of a quadrilateral = 360°

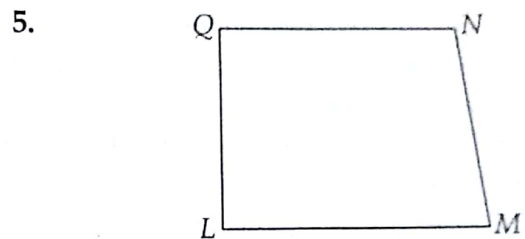
$$\therefore 90^\circ + 80^\circ + 125^\circ + x^\circ = 360^\circ$$

$$\Rightarrow 295^\circ + x^\circ = 360^\circ$$

$$\Rightarrow x^\circ = 360^\circ - 295^\circ$$

$$\Rightarrow x^\circ = 65^\circ$$

Thus, the value of x is 65.



$LMNQ$ is the required quadrilateral.

- (i) Two pairs of opposite angles:

$$\angle QLM, \angle QNM; \angle LQN, \angle LMN$$

- (ii) Two pairs of opposite sides:

$$QL, NM; QN, LM$$

- (iii) Two pairs of adjacent sides:

$$QL, LM; QN, NM$$

- (iv) Two pairs of adjacent angles:

$$\angle NQL, \angle QLM; \angle QNM, \angle NML$$

6. Let the four angles of the quadrilateral be $3x, 4x, 6x$ and $7x$.

\therefore Sum of the angles of a quadrilateral = 360°

$$\therefore 3x + 4x + 6x + 7x = 360^\circ$$

$$\Rightarrow 20x = 360^\circ$$

$$\Rightarrow x = \frac{360^\circ}{20} = 18^\circ$$

Thus, all four angles of the quadrilateral are :

$$3x = 3 \times 18^\circ = 54^\circ,$$

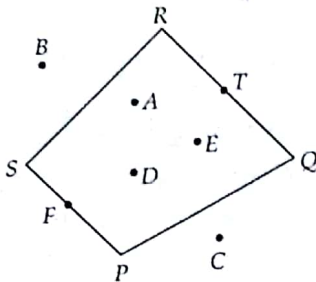
$$4x = 4 \times 18^\circ = 72^\circ,$$

$$6x = 6 \times 18^\circ = 108^\circ,$$

$$7x = 7 \times 18^\circ = 126^\circ.$$

REVIEW EXERCISE

1. (i) The points A, D, E lie in the interior of quadrilateral PQRS.



- (ii) The points T and F lie on the boundary of quadrilateral PQRS.
 (iii) The points B and C lie in the exterior of quadrilateral PQRS.
2. Let the four angles of the quadrilateral be x , $2x$, $3x$ and $4x$.

\therefore Sum of the angles of a quadrilateral = 360°

$$\therefore x + 2x + 3x + 4x = 360^\circ$$

$$\Rightarrow 10x = 360^\circ$$

$$\Rightarrow x = \frac{360^\circ}{10} = 36^\circ$$

Thus, the four angles of a quadrilateral are :

$$x = 36^\circ,$$

$$2x = 2 \times 36^\circ = 72^\circ,$$

$$3x = 3 \times 36^\circ = 108^\circ,$$

$$4x = 4 \times 36^\circ = 144^\circ.$$

3. Let the other angle of the quadrilateral be x .

\therefore Sum of the angles of a quadrilateral = 360°

$$\therefore 54^\circ + 97^\circ + 86^\circ + x = 360^\circ$$

$$\Rightarrow 237^\circ + x = 360^\circ$$

$$\Rightarrow x = 360^\circ - 237^\circ$$

$$\Rightarrow x = 123^\circ$$

Thus, the other angle is 123° .

4. Let the measure of each of two equal angles of the quadrilateral be x . Then,

$$75^\circ + 115^\circ + x + x = 360^\circ$$

(\therefore Sum of the angles of a quadrilateral is 360°)

$$\Rightarrow 190^\circ + 2x = 360^\circ$$

$$\Rightarrow 2x = 360^\circ - 190^\circ$$

$$\Rightarrow 2x = 170^\circ$$

$$\Rightarrow x = \frac{170^\circ}{2}$$

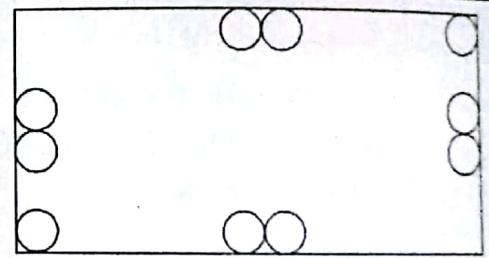
$$\Rightarrow x = 85^\circ$$

Thus, the measure of each equal angle is 85° .

HOTS QUESTIONS

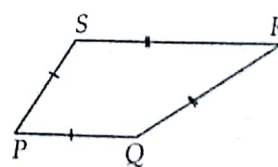
1. (i) I have one pair of opposite sides parallel. (Trapezium)
- (ii) I have opposite sides equal, adjacent sides unequal and all angles equal to 90° . (Rectangle)
- (iii) I have both the pairs of opposite sides parallel and diagonals of different measures. (Parallelogram)
- (iv) I have all sides equal, pairs of opposite sides parallel and my diagonals are mutually perpendicular. (Rhombus)

Puzzle

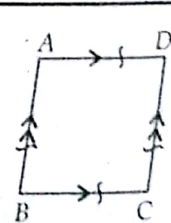


The rectangle represents the table and the circles represent the dishes.

VALUE CORNER



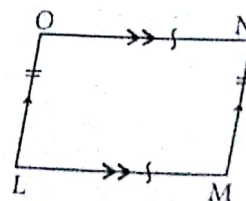
(Trapezium)



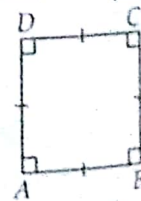
(Rhombus)



(Rectangle)



(Parallelogram)



(Square)

"Everyone is unique and special."