

Property of parallelogram

1. Opposite angle are equal
2. Opposite sides are equal
3. Diagonal bisect each other
4. Diagonal divide parallelogram into two congruent triangle.

Q. If ABCD is $\parallel^m$ find x,y

Sol. In $\parallel^m$ diagonal bisect each other

$$\therefore OA = OC$$

$$x - 5 = 7$$

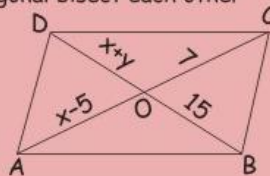
$$x = 12$$

and $OB = OD$

$$15 = x + y$$

$$15 = 12 + y$$

$$y = 3$$



Q. ABCD is $\parallel^m$ find all angles of $\parallel^m$

Sol. $\angle C = \angle A = 50^\circ$

$$\therefore \angle C = 50^\circ$$

as $AB \parallel CD$

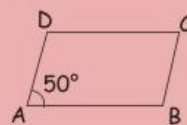
$$\therefore \angle A + \angle D = 180^\circ$$

$$50^\circ + \angle D = 180^\circ$$

$$\angle D = 130^\circ$$

$$\angle B = \angle D = 130^\circ$$

$$\therefore \angle B = 130^\circ$$



Quadrilaterals

A quadrilateral is four sided closed figure.

Angle sum property

sum of all interior angle of quadrilateral is 360°

Q. Angles of Quadrilateral are in the ratio 1 : 2 : 3 : 4 find angles.

Sol. Let angle are x, 2x, 3x, 4x

$$x + 2x + 3x + 4x = 360$$

$$10x = 360$$

$$x = 36$$

So, angle are 36, 2×36 , 3×36 , 4×36
i.e. 36° , 72° , 108° , 144°

Polygon

Sum of interior angle = $(n-2)180$

Sum of exterior angle = 360°

For Regular polygon

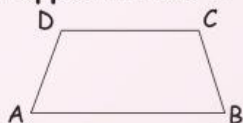
$$\text{Each Interior angle} = \frac{(n-2)180}{n}$$

$$\text{Each Interior angle} = \frac{360}{n}$$

Types of Quadrilateral

Trapezium

Quadrilateral with one pair of opposite side is parallel.



If $AD = BC$, it is known as isosceles trapezium

Parallelogram

Quadrilateral in which both pair of opposite side is parallel.



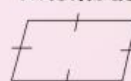
Rectangle



$\parallel^m$ with all angle 90°

*Length of diagonal are equal

Rhombus



$\parallel^m$ with all side equal

*diagonal bisect each other at 90°

Kite



Quadrilateral in which adjacent sides equal but unequal opp. side

Square



$\parallel^m$ with all side equal and all angle 90°

*Length of diagonal are equal
*Diagonal bisect at 90°