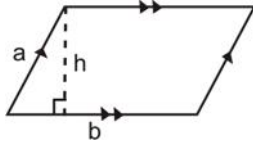


MATHEMATICS

PLANE FIGURE / SHAPES

Properties of Parallelogram, Rhombus and kite.

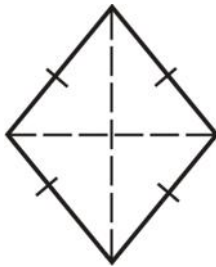
2. Parallelogram



Properties

- i. Opposite sides are equal and are parallel to each other.
- ii. Opposite angles are equal.
- iii. It has two diagonals.
1. Each diagonal bisects the parallelogram into two equal parts.
1. Two lines of symmetry.

1. Rhombus



- Properties**
- i All sides are equal
 - ii Opposite angles are equal
 - iii. It has two diagonals.
 - iv. Each diagonal bisects it into two equal parts.
 - v. Diagonals bisect each other at 90°
 - vi. Two line of symmetry

i. Kite

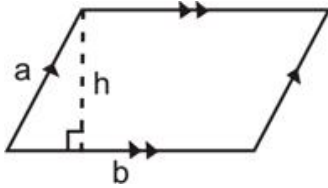


Properties

- i. Two pairs of adjacent sides are of equal length.
3. Only two angles are equal.
- iii. Only one diagonal bisects the kite into two equal parts.
- iv. One line of symmetry.

MATHEMATICAL FORMULAS FOR PARALLELOGRAM, RHOMBUS AND KITE

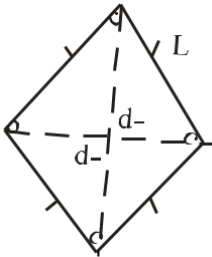
1. Parallelogram:



Area = $b \times h$ or Area = $ab \sin \theta$

Perimeter = $2a + 2b$

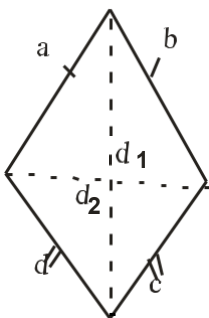
2. Rhombus



Area = $\frac{1}{2} (d_1 \times d_2)$

Perimeter = $4L$

= **Kite**



Where $a = b$ and $c = d$

Area = $\frac{1}{2} (d_1 \times d_2)$

Perimeter = $2a + 2c$

SCALE DRAWING

Example 1: An airport runway measuring 6000m is drawn to a scale of 1cm represents 500m.

Find its length on the drawing.

Solution

500m: 1cm

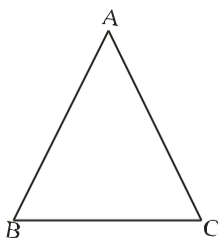
1m = $\frac{1}{500}$ cm

$$6000\text{m} = \frac{6000}{1} \times \frac{1\text{cm}}{500} = 12\text{cm}$$

PLANE FIGURE / SHAPE (CONTD)

A. Properties of Triangle, Rectangle and Circle

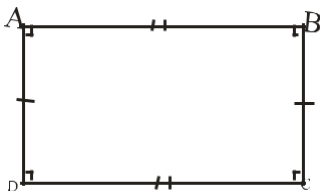
1. Triangle



Properties

- i. It has three sides and three angles.
 - (i) The angles, as well as the sides, may be equal or different.
 - (ii) It has no diagonal.

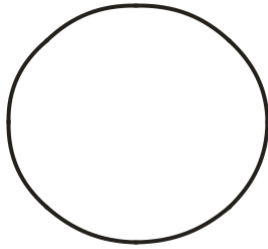
2. Rectangle



Properties

- i. Opposite sides are equal and parallel.
 - (1) It has four angles and two diagonals.
 - (2) Each diagonal bisects it into two equal parts.
 - (3) Diagonals intersect at an angle of 90° .
 - (4) Two lines of symmetry.

3. Circle



Properties

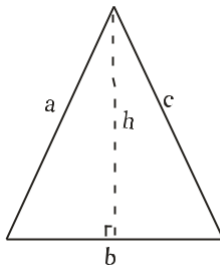
i. It is bounded by circumference.

1 Diameter divides the circle into two equal parts.

2 Distance from the center to any point on the circumference is the radius (r) etc.

MATHEMATICAL FORMULAE FOR TRIANGLE, RECTANGLE AND CIRCLE

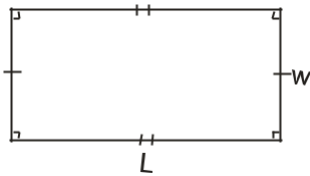
1. Triangle



Area = $\frac{1}{2} \times b \times h$ or $\frac{1}{2} ab \sin \theta$

Perimeter = $a + b + c$

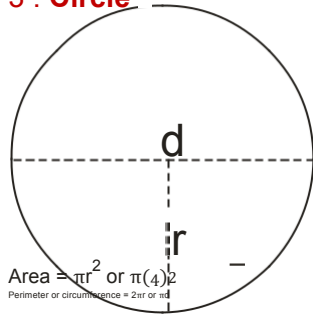
2. Rectangle



Area = $L \times W$

Perimeter = $2L + 2W$

3 . Circle



SCALE DRAWING

Example 1:

On a scale drawing of the length of an advertisement bill board is 5cm. What is the actual length of the billboard, if the scale is 1cm represents 2m?

Solution

1cm to 2cm

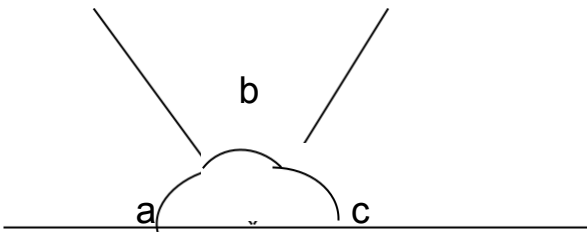
5cm = 5×2 m = 10 m

Actual length of billboard = 10 m

Angle

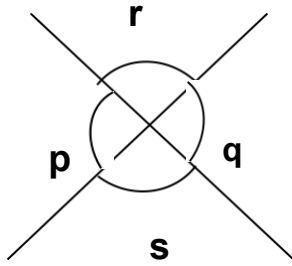
A. Sum of angles in a polygon

i. Angles on a straight line is 180^0



$$\therefore a + b + c = 180^0$$

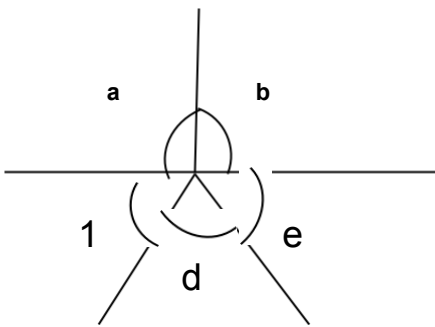
2. Vertically opposite angles are equal



$$r = s$$

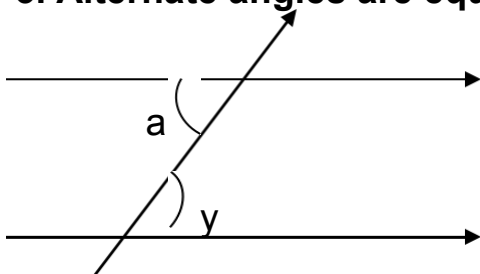
$$p = q$$

iii. Angles at a point is equal to 360°



$$\therefore a + b + c + d + e = 360^{\circ}$$

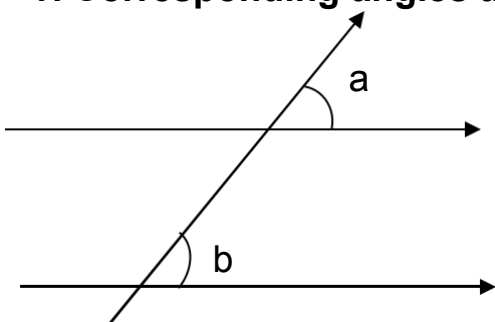
3. Alternate angles are equal



\therefore Alternate angles are equal

$$x = y$$

v. Corresponding angles are equal



corresponding angles are equal

$$a = b$$

Polygon

This is a plane figure bounded by straight line.

s/n	Shapes	No of sides	Formula / sum of angles
i.	Triangle	3	$\hat{a} + \hat{b} + \hat{c} = 180$
ii.	Quadrilateral	4	$(n-2) \times 180$ where $n = 4$
iii.	Pentagon	5	$(n-2) \times 180$ where $n = 5$
iv.	Hexagon	6	$(n-2) \times 180$ where $n = 6$
v.	Heptagon	7	$(n-2) \times 180$ where $n = 7$
vi.	Octagon	8	$(n-2) \times 180$ where $n = 8$
Vii	Nonagon	9	$(n-2) \times 180$ where $n = 9$
viii.	Decagon	10	$(n-2) \times 180$ where $n = 10$

Sum of exterior angles of a regular polygon = 360.