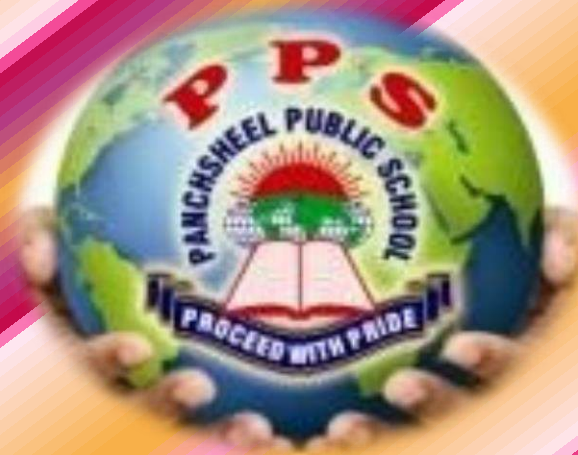


**PANCHSHEEL PUBLIC SCHOOL**  
**SESSION 2024-25**  
**ENTRANCE EXAMINATION**



**CLASS - 7**  
**SYLLABUS**  
**STUDY MATERIAL**  
**SAMPLE PAPER**

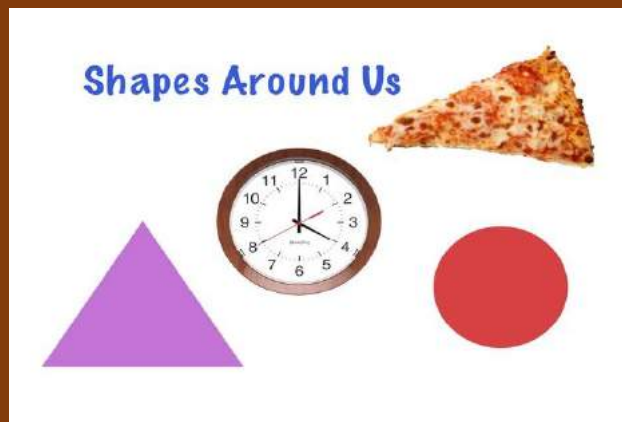
# MATHEMATICS

## SYLLABUS



### CLASS - 7

1. The boundary and region occupied (Area and Perimeter)
2. Shapes around us (Two dimensional and Three dimensional)
3. Height , Weight and Distance (Measuring units)





## PANCHSHEEL PUBLIC SCHOOL

10+2 Senior Secondary School (Affiliated & Recognized by CBSE)

Jaitpur, Badarpur, New Delhi-44

SESSION - 2024-25

ENTRANCE EXAM

STUDY MATERIAL AND SAMPLE PAPER

### The boundary and region occupied (Area and Perimeter)

#### Introduction

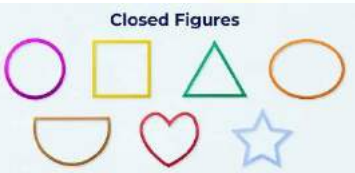
In this section, we shall study the Perimeter and Area of plane figures. The Perimeter of the plane figures is the measure related to its Boundary and the Area of the plane figures is the measure related to its region or surface occupied by it.

#### What Are Plane Figures?

Plane figures are two-dimensional figures which are drawn on the plane surface.

#### Open Figures

In the open figures, the starting point and the ending point of the figure are not at the same point. The figures in which the starting point and the ending point are not joined, are called open figures.



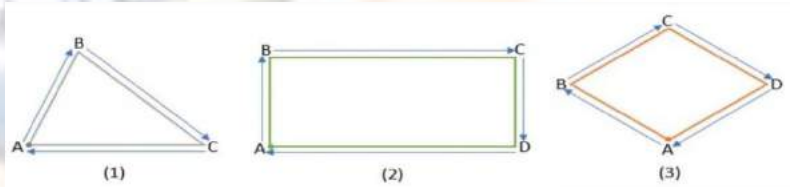
#### Closed Figures

In the closed figures, the starting point and the ending point of the figure are at the same point. The figures in which the starting point and the ending point are joined, are called closed figures.

#### Perimeter

Perimeter is the complete measurement of the boundary of the closed figures. The Perimeter of the closed figures can be found but not of the open figures.

In the below figures, to calculate the perimeter we start from point A and the complete measurement is from point A to point A.



For figure (1), Perimeter =  $AB + BC + CA$

For figure (2), Perimeter =  $AB + BC + CD + DA$

For figure (3), Perimeter =  $AB + BC + CD + DA$

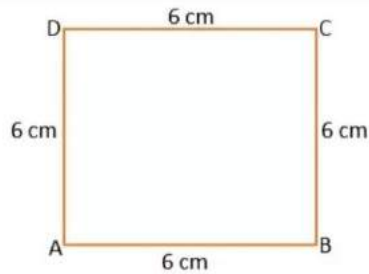
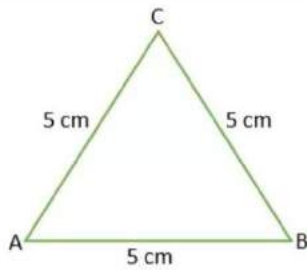
#### The Perimeter Of Irregular Shapes

Irregular shapes are figures that have all the sides and all the angles of different measures. Such types of figures are called irregular closed figures. The Perimeter of irregular shapes is the total of all sides.

#### The Perimeter Of Regular Shapes

The figures that have all the sides and all the angles of the same measure are called Regular shapes. These types of figures are called Regular closed figures. For regular shapes, we can find the perimeter by multiplying the number of sides by the measure of each side. We can understand it by the example solved below.

Example – Find the perimeter of the figures given below.



Solution –

In figure (1), all three sides of the triangle are equal which means this triangle is an equilateral triangle.

Therefore, The Perimeter of an Equilateral Triangle =  $3 \times \text{Side}$

$$= 3 \times 5 \text{ cm} = 15 \text{ cm} \quad \text{Ans.}$$

In figure (2), all four sides are equal so it is a square.

Therefore, The Perimeter of the Square =  $4 \times \text{Side}$

$$= 4 \times 6 \text{ cm} = 24 \text{ cm} \quad \text{Ans.}$$

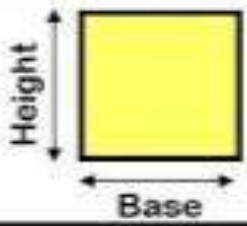
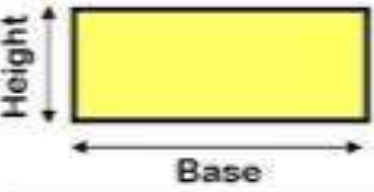
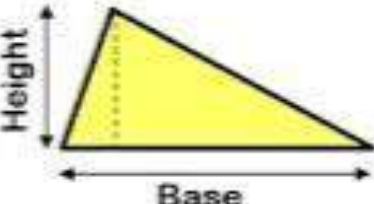
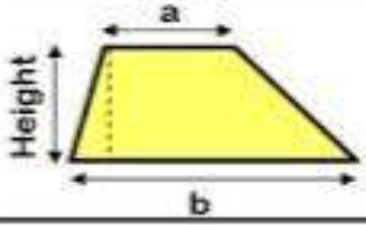
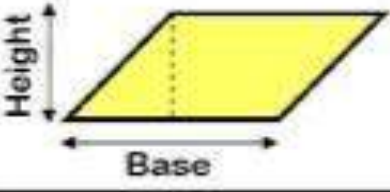
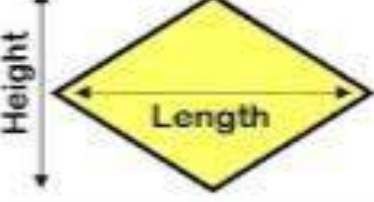
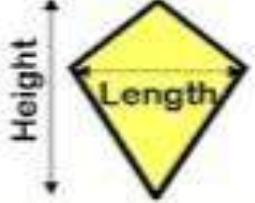
Note – We can make a general formula to find the perimeter of a regular shape.

The perimeter of a Regular shape = Number of sides  $\times$  Measure of each side.

### Area

When we draw a closed figure, the figure covers the region which is enclosed by that. That region is known as the Area of the figure.

Name	Figure	Perimeter
Rectangle		$2(a + b)$
Square		$4a$
Triangle		$a + b + c$
Right Triangle		$b + h + d$
Equilateral Triangle		$3a$
Isosceles Right Triangle		$2a + d$
Parallelogram		$2(a + b)$
Rhombus		$4a$
Trapezium		$a + b + c + d$
Circle		$2\pi r$

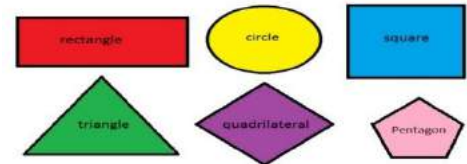
Shape	Name	Formula for Area
	Square	Base x Height
	Rectangle	Base x Height
	Triangle	Base x Perpendicular Height ÷ 2
	Trapezium	$\frac{(a + b) \times \text{height}}{2}$
	Parallelogram	Base x Perpendicular Height
	Rhombus	Length x Height ÷ 2
	Kite	Length x Height ÷ 2



# Topic :- Shapes around us( Two dimensional and Three dimensional)

## 2D Shapes

A plane object that has only length and breadth is 2 dimensional. Straight or curved lines make up the sides of this shape. Also, these figures can have any number of sides. In general, plane figures made of lines are known as polygons. For example, triangles and squares are polygons.



### Types of 2D Shapes

#### Regular 2D Shapes



Quadrilateral



Triangle



Pentagon



Hexagon

#### Irregular 2D Shapes



Quadrilateral



Triangle



Pentagon



Hexagon

2D shapes are further classified into 2 types – regular or irregular – based on their length and interior angles.

A 2D shape is considered to be regular if all of its sides have the same length and all of its interior angles are of the same measurement.

A 2D shape is irregular if all of its sides are unequal in length and all of its angles are unequal in measurement.

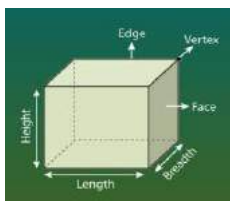
## 3D Shapes

When you look around the room in your house, you can see many objects that have different shapes. For example, furniture, books, ball etc. These shapes are called solid shapes. It consists of 3 dimensions, namely length, breadth, and height. Solid shapes are also known as 3D shapes. These solid shapes occupy space and are found in our day-to-day life. We touch, feel, and use them.

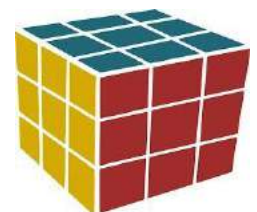
**Solid shapes are three-dimensional shapes that have length, breadth, and height as the three dimensions.**

### Types of 3D shapes-

#### Cube:

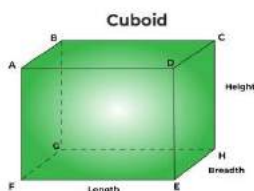


A cube is a three-dimensional object which is formed when six identical squares bind to each other in an enclosed form. A cube has 6 faces, 12 edges, and 8 vertices. In other words, a cuboid whose length, breadth and height are equal is called a cube.

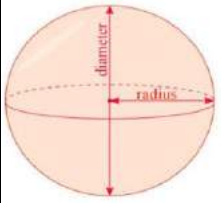


#### Cuboid:

The cuboid shape has a closed three-dimensional structure surrounded by rectangular faces, which are rectangle plane sections. It is one of the most prevalent shapes in our environment, with three dimensions: length, breadth, and height.



## Sphere:

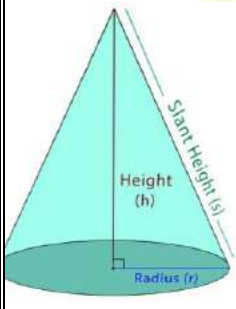
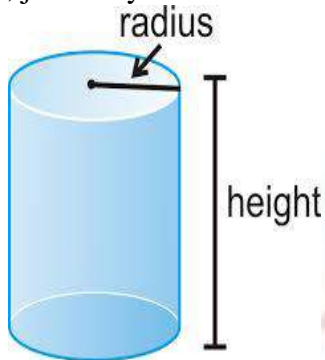


A sphere is a solid shape, absolutely round in shape, defined in three-dimensional space. Every point on the surface is equidistant from the center.



## Cylinder:

A cylinder is a solid shape defined on a three-dimensional plane. It holds two parallel bases, circular in shape, joined by a curved surface (like a tube), at a fixed distance.

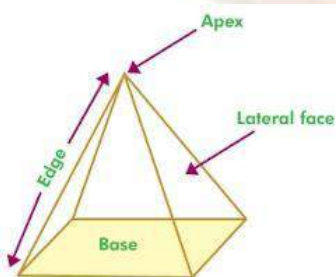


## Cone:

A cone is a distinctive solid shape defined in a three-dimensional space. It has a flat surface and a curved surface, pointing towards the top. It is formed by a set of line segments connected from the circular base to a common point, known as the apex or vertex. Based on how the apex is aligned to the center of the base, a right cone or an oblique cone is formed.



## Pyramid:



A pyramid is a solid shape or a polyhedron with a polygon base and all lateral faces are triangles. Pyramids are typically described by the shape of their bases. A pyramid with a:

- Triangular base is called a Tetrahedron.
- A quadrilateral base is called a square pyramid.
- Pentagon base is called a pentagonal pyramid.
- Regular hexagon base is called a hexagonal pyramid.



# Height , Weight and Distance(Measuring units)

## Measurement

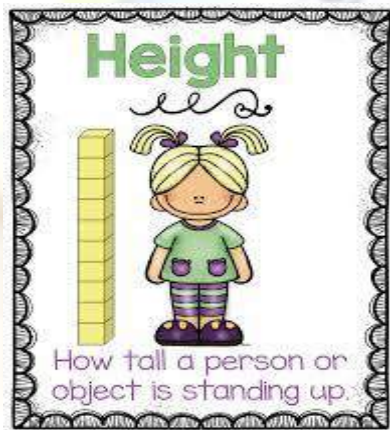
Measurement is the numeric value with certain units of measurement. We can measure length, weight, speed , temperature and capacity of a given object with a certain unit and numeric value. We can use standard as well as common units to measure something. E.g To measure time we can use hours, minutes and seconds.



## Measurement of Height:

It is defined as the measurement of the distance of an object from the base to the top. Sometimes, in Geometry, it is labelled as altitude. It measures the vertical distance from the lowest to the highest point.

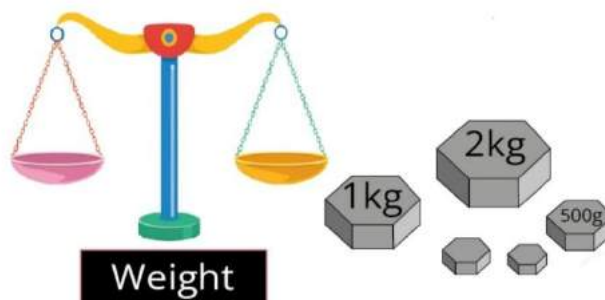
1 metre = 100 cm



## Measurement of Weight

To measure the weight or mass of the different types of object we can use kilogram in short (kg), gram (gm) and milligram (mg), depending upon the size of the object for small size object we can use milligram or gram and for large size object we will use kilogram (kg). The SI unit of weight is kilogram (kg).

1 kg = 1000 g



Measuring weight



## Measurement of Distance

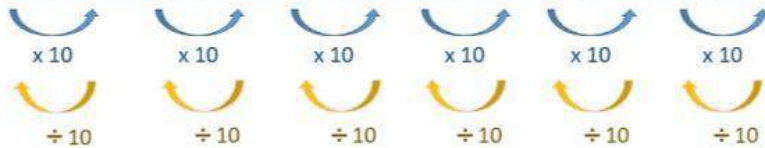
The SI unit of length is a metre (m). One metre (m) is divided into 100 equal parts called centimetre (cm). One centimetre (cm) has 10 equal parts called millimetre (mm). For measuring longer distances, we use a larger unit of length called, kilometre (km).

$$1 \text{ km} = 1000 \text{ m}$$



## Conversion

Kilo	Hecto	Deka/Deca	(Unit)	Deci	Centi	Milli
Kilometer	Hectometer	Dekameter	Meter	Decimeter	Centimeter	Millimeter
Kilogram	Hectogram	Dekagram	Gram	Decigram	Centigram	Milligram
Kiloliter	Hectoliter	Dekaliter	Liter	Deciliter	Centiliter	Milliliter





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## Q.1 Multiple choice questions: (1 x 5 = 5 marks)

(a) Which of the following is an example of cone?

- (i) Cylinder (ii) Dice (iii) Birthday Cap



(b) Aman has a photo frame. He wants to decorate its boundary. So he needs to find its .....

- (i) Area (ii) Perimeter (iii) Radius



(c) To measure the distance between two cities, we use ..... as Measuring unit.

- (i) Kg (ii) Km (iii) Cm

(d) A circle has \_\_\_\_\_ sides.

- (i) 4 (ii) 2 (iii) 0



(e) ..... is the length of the boundary of a plane closed shape.

- (i) Circle (ii) Area (iii) Perimeter

## Q.2 Fill in the blanks: (1 x 2 = 2 marks)

(a) 5 km = .....m

(b) A road roller is liye n example of .....shape.

## Q.3 Solve the following: (2 x 4 = 8 marks)

(a) Shikha runs around a square of side 75 m. Priya runs around a rectangle with length 60 m and breadth 45 m. Who covers the smaller distance? (2)



(b) Peter wants to fence the park in front of his house on three sides, which measure 152 m 40 cm, 205 m 10 cm and 310 m 39 cms. Find the total length that is to be fenced. (2)

(c) Tina wants a new carpet for her rectangular dining room. Her dining room is a 5 meters by 7 meters rectangle. How much carpet does she need to buy to cover her entire dining room. (2)

(d) A worker transferred 50 bags of rice weighing 38 kg 500 g each into a truck. The weight of empty truck is 1480 kg. What will be the weight of the truck with the bags? (2)

