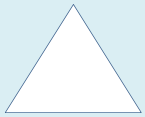
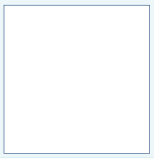
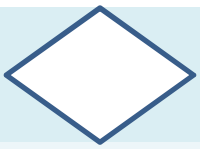
AREA ,PERIMETER AND VOLUME FORMULA

Perimeter and Area of Different Figure(2D)

N	Shape	Perimeter/height	Area
1	Right angle triangle Base =b, Height =h Hypotenuse=d 	P=b+h+d Height =h	$\boldsymbol{A = \frac{1}{2}bh}$
2	Isosceles right-angled triangle Equal side =a	$p = 2a + a\sqrt{2}$ Height=a	$A = \frac{1}{2}a^2$
3	Any triangle of sides a, b, c 	P=a+b+c	1. If base and Altitude given $A = \frac{1}{2}\ Base\ \times Altitude$ 2. if the all the lengths of the sides are known $A = \sqrt{s(s-a)(s-b)(s-c)}$ Where $s = \frac{a+b+c}{2}$ This is called Heron's formula

				(sometimes called Hero's formula) is named after Hero of Alexandria
4	Square Side =a 		P=4a	**$A=a^2$**
5	Rectangle of Length and breadth L and B respectively 	P=2L +2B		A=LX B
6	Parallelograms Two sides are given as a and b 	P=2a+2b		A= BaseX height When the diagonal is also given ,say d Then $A = 2\sqrt{s(s-a)(s-b)(s-d)}$ Where $s = \frac{a+b+d}{2}$
7	Rhombus Diagonal d_1 and d_2 are given	$p = 2\sqrt{d_1^2 + d_2^2}$ $side = \frac{1}{2}\sqrt{d_1^2 + d_2^2}$		$A = \frac{1}{2}d_1 d_2$



8 Quadrilateral

a) All the sides are given a,b,c ,d

b) Both the diagonal are perpendicular to each other

c) When a diagonal and perpendicular to diagonal are given

a) P=a+b+c+d

a)

$$A = \sqrt{(s-a)(s-b)(s-c)(s-d)}$$

where $s = \frac{a+b+c+d}{2}$

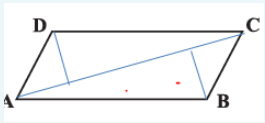
b)

$$A = \frac{1}{2} d_1 d_2$$

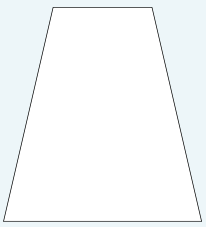
where d_1 and d_2 are the diagonal

c) $A = \frac{1}{2} d(h_1 + h_2)$

where d is diagonal and h_1 and h_2 are perpendicular to that



9 Trapezium



P= Sum of length of all the sides

A=(1/2)h(a+b)

Half the product of the sum of the lengths of parallel sides and the perpendicular distance between them gives the area of trapezium

10 Kite

Sides b and c are Given

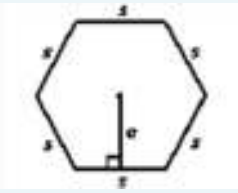
And diagonals are given as d_1 and d_2

2b + 2c

$$A = \frac{1}{2} d_1 d_2$$

where d_1 and d_2 are the diagonal

11 Regular Polygon



P = ns

Where n is the number of sides

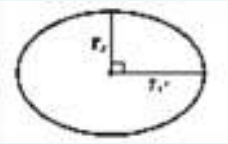
And s is the side

$$A = \frac{1}{2} \times a \times P$$

Where a = apothem

P = Perimeter

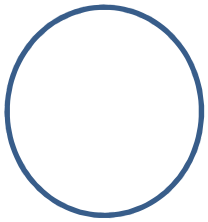
12 Ellipse



$$P \approx 2\pi \sqrt{\frac{1}{2}(r_1^2 + r_2^2)}$$

$$A = \pi r_1 r_2$$

Area of Circles



S.no	Terms	Descriptions
1	Circumference of a circle	$2\pi r$.
2	Area of circle	πr^2
3	Length of the arc of the sector of angle	Length of the arc of the sector of angle θ $\frac{\theta}{360} 2\pi r$
4	Area of the sector of angle	Area of the sector of angle θ $\frac{\theta}{360} \pi r^2$
5	Area of segment of a circle	Area of the corresponding sector – Area of the corresponding triangle

Unit Conversion for Perimeter

1 Meter	**10 Decimeter**	**100 centimeter**
1 Decimeter	10 centimeter	100 millimeter
1 Km	10 Hectometer	100 Decameter

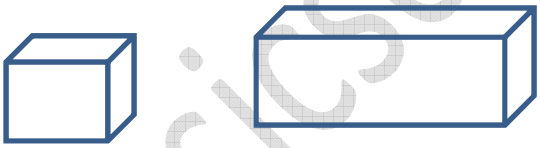
1 Decameter	10 meter	1000 centimeter

Unit Conversion for Area

1 square Meter	**100 square Decimeter**	**10000 square centimeters**
1 square Decimeter	100 square centimeter	10000 square millimeter
1 Hectare	100 square Decameter	10000 square meters
1 square myraimeter	100 square kilometer	10^8 square meter

Surface Area and Volume of 3D different Figure

Surface Area and Volume of Cube and Cuboid

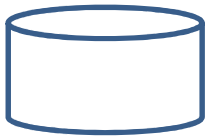


Cube Cuboid

Type	Measurement
Surface Area of Cuboid of Length L, Breadth B and Height H	2(LB + BH + LH).

Lateral surface area of the cuboids	2(L + B) H
Diagonal of the cuboids	$\sqrt{L^2 + B^2 + H^2}$
Volume of a cuboids	LBH
Length of all 12 edges of the cuboids	4 (L+B+H).
Surface Area of Cube of side L	$6L^2$
Lateral surface area of the cube	$4L^2$
Diagonal of the cube	$L\sqrt{3}$
Volume of a cube	L^3

Surface Area and Volume of Right circular cylinder



Radius	**The radius (r) of the circular base is called the radius of the cylinder**
Height	The length of the axis of the cylinder is called the height (h) of the cylinder
Lateral Surface	The curved surface joining the two bases of a right circular cylinder is called Lateral Surface.

Type	Measurement
Curved or lateral Surface Area of cylinder	2πrh
Total surface area of cylinder	2πr (h+r)

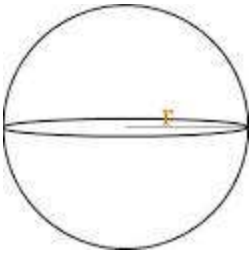
Volume of Cylinder	$\pi r^2 h$

Surface Area and Volume of Right circular cone

Radius	**The radius (r) of the circular base is called the radius of the cone**
Height	The length of the line segment joining the vertex to the center of base is called the height (h) of the cone.
Slant Height	The length of the segment joining the vertex to any point on the circular edge of the base is called the slant height (L) of the cone.
Lateral surface Area	The curved surface joining the base and uppermost point of a right circular cone is called Lateral Surface

Type	Measurement
Curved or lateral Surface Area of cone	πrL
Total surface area of cone	$\pi r (L+r)$
Volume of Cone	$\frac{1}{3}\pi r^2 h$

Surface Area and Volume of sphere and hemisphere



Sphere

Hemisphere

Sphere	**A sphere can also be considered as a solid obtained on rotating a circle About its diameter**
Hemisphere	A plane through the centre of the sphere divides the sphere into two equal parts, each of which is called a hemisphere
radius	The radius of the circle by which it is formed
Spherical Shell	The difference of two solid concentric spheres is called a spherical shell
Lateral Surface Area for Sphere	Total surface area of the sphere
Lateral Surface area of Hemisphere	It is the curved surface area leaving the circular base

Type	Measurement
Surface area of Sphere	$4\pi r^2$
Volume of Sphere	$\frac{4}{3}\pi r^3$
Curved Surface area of hemisphere	$2\pi r^2$
Total Surface area of hemisphere	$3\pi r^2$
Volume of hemisphere	$\frac{2}{3}\pi r^3$
Volume of the spherical shell whose outer and inner radii and 'R' and 'r' respectively	$\frac{4}{3}\pi(R^3 - r^3)$

Volume Unit conversion

$1\ cm^3$	1mL	$1000\ mm^3$
1 Litre	1000ml	$1000\ cm^3$
$1\ m^3$	$10^6\ cm^3$	1000 L
$1\ dm^3$	$1000\ cm^3$	1 L