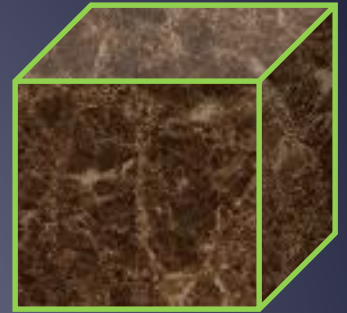
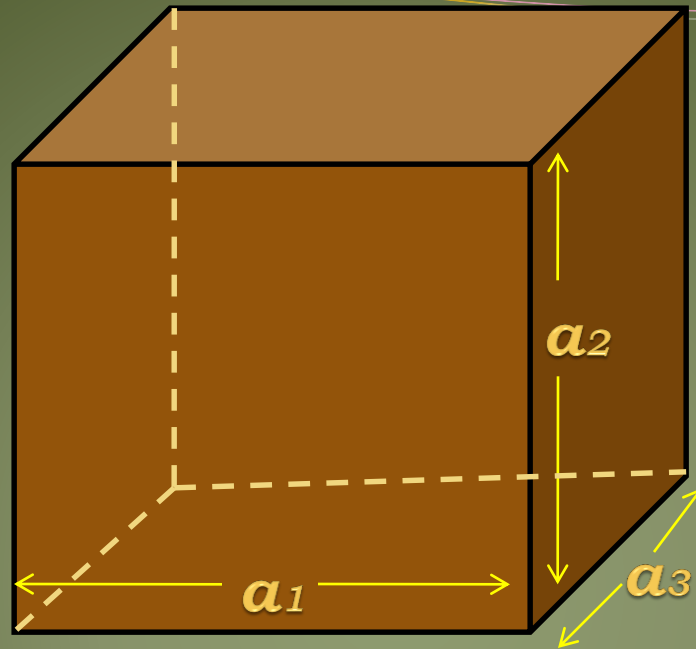


SURFACE AREA AND VOLUME



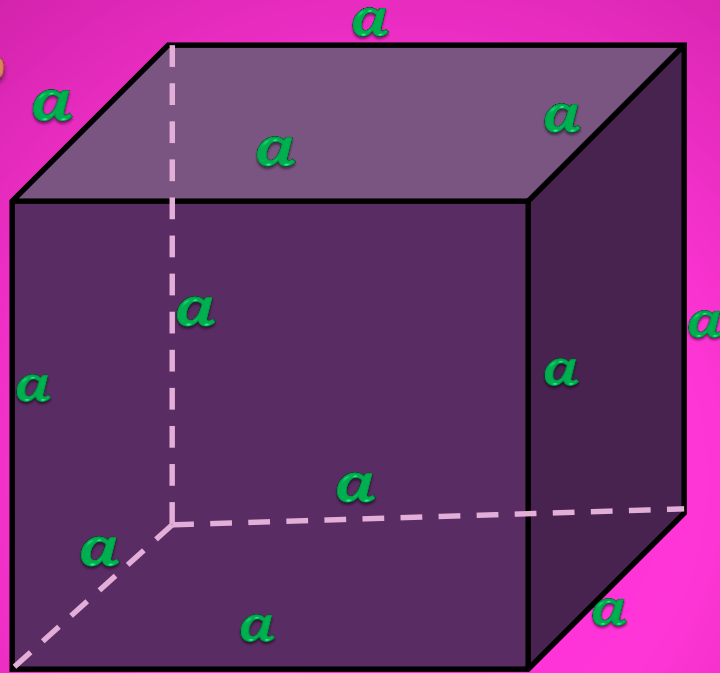
*Project work on
Mathematics*



$$a_1 = a_2 = a_3$$

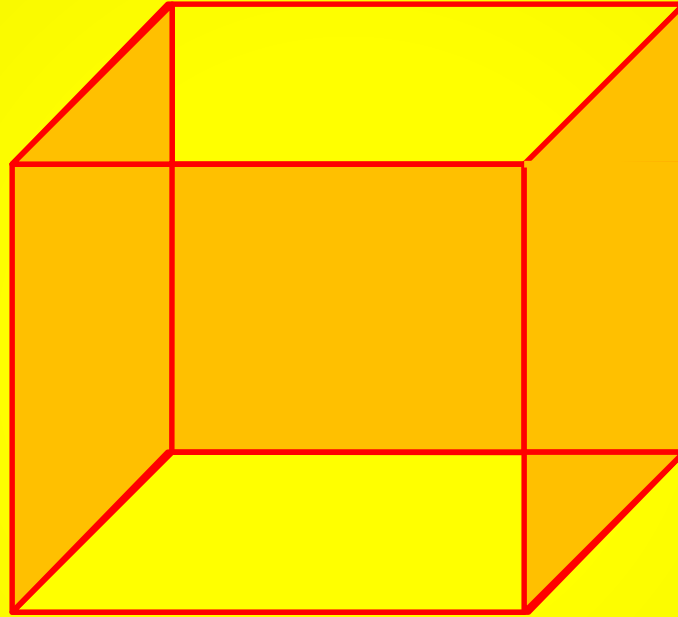
CUBE :- A solid three-dimensional geometric figure bounded by six planes; each of the six sides or faces of a cube is a

FINDING THE SURFACE AREA OF CUBE.



$$\begin{aligned} &= (a \times a) + (a \times a) + (a \times a) + (a \times a) + (a \times a) + (a \times a) \\ &= 6(a \times a) \\ &= 6a^2 \end{aligned}$$

FINDING LATERAL SURFACE AREA OF CUBE:-

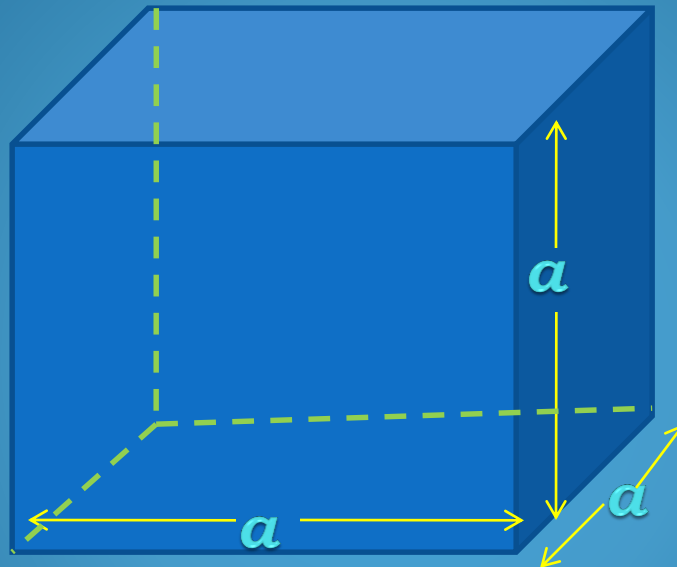


We know that total surface area of cube = $6a^2$.

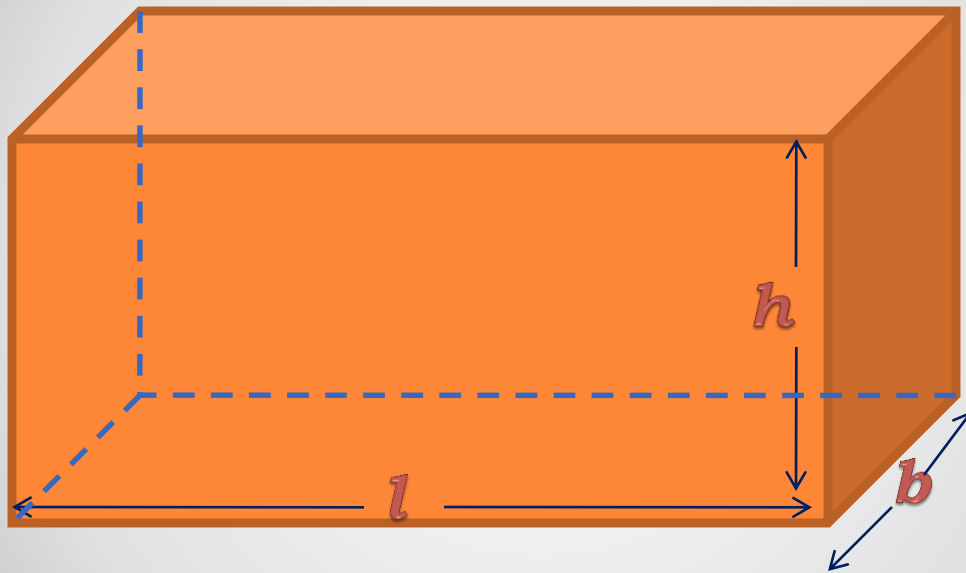
The area of top and bottom is reduced. So
remaining area :-

$$6a^2 - (a^2 + a^2) = 4a^2$$

FINDING THE VOLUME OF CUBE :-

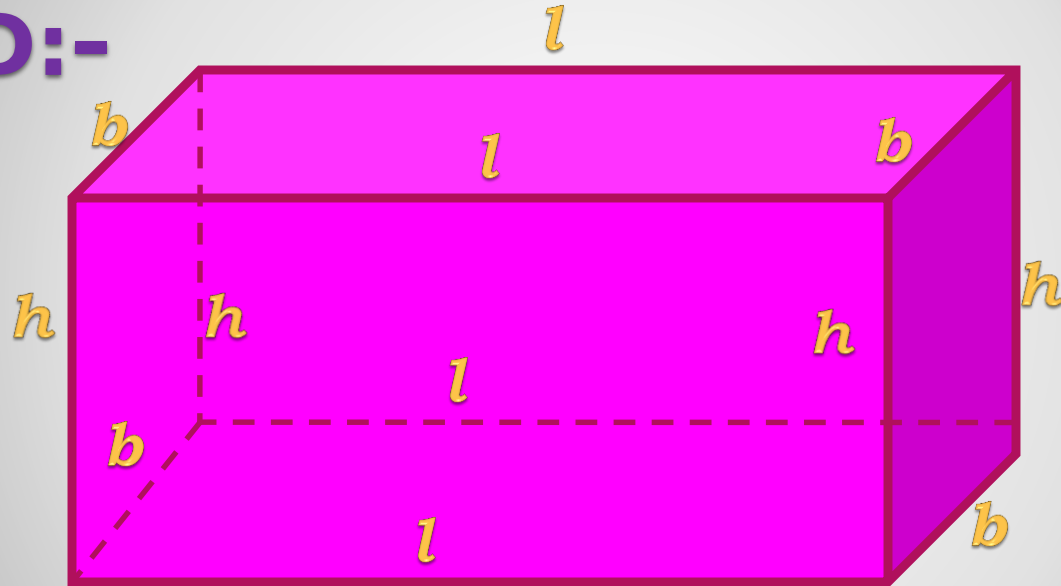


$$\begin{aligned} &= a \times a \times a \\ &= a^3 \end{aligned}$$



CUBOID :- A three-dimensional geometric figure formed of six rectangular plane faces, each set at right angles to the four sides adjacent to it.

FINDING TOTAL SURFACE AREA OF CUBOID:-



$$\begin{aligned} &= (l \times b) + (b \times h) + (h \times l) + (l \times b) + (b \times h) + (h \times l) \\ &= 2(l \times b) + 2(b \times h) + 2(h \times l) \\ &= 2(lb + bh + hl) \end{aligned}$$

FINDING LATERAL SURFACE AREA OF CUBOID :-

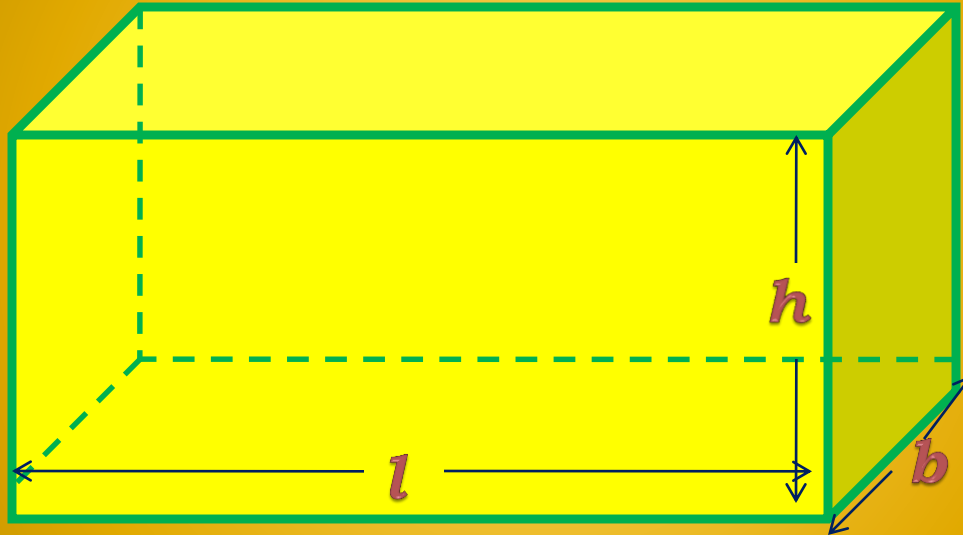


$$= (l \times h) + (l \times h) + (b \times h) + (b \times h)$$

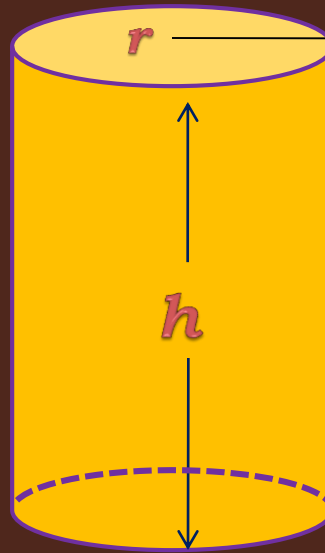
$$= 2(l \times h) + (b \times h)$$

$$= 2(l + b)h$$

FINDING VOLUME OF CUBOID:-

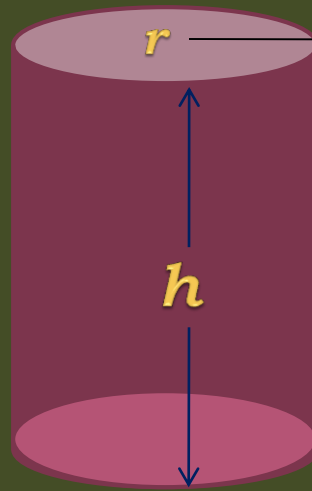


$$= l \times b \times h$$



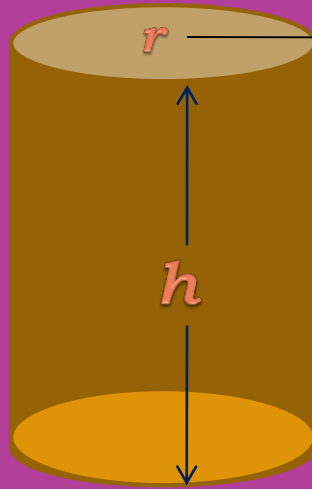
CYLINDER:- Cylinder consists of two circular bases of equal area in parallel planes, that are connected by a lateral surface that intersects the boundaries of the bases.

FINDING CURVED SURFACE AREA OF CYLINDER:-



We know perimeter of circle with radius $r = 2\pi r$
So curved surface area of Cylinder $= 2\pi r \times h$
 $= 2\pi rh$

TOTAL SURFACE AREA OF CUBOID :-

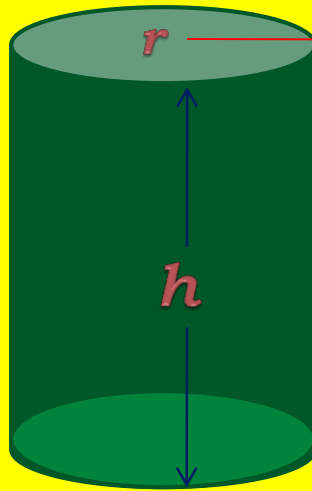


Curved surface area of cuboid $= 2\pi rh$

Area of two circles $= 2 \times \pi r^2$

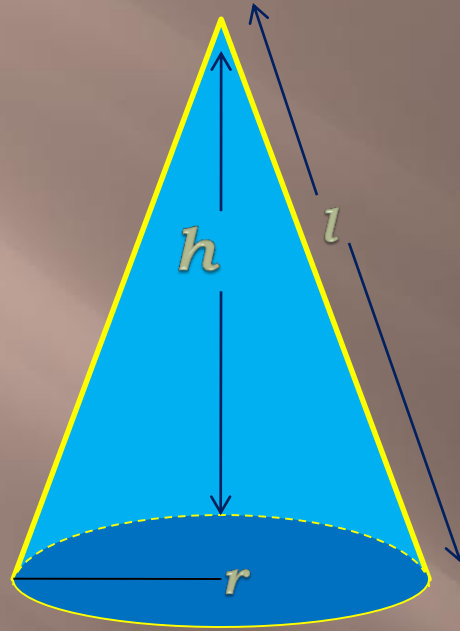
Total surface area of cuboid $= 2\pi rh + 2\pi r^2$
 $= 2\pi r(r + h)$

FINDING VOLUME OF CUBOID :-



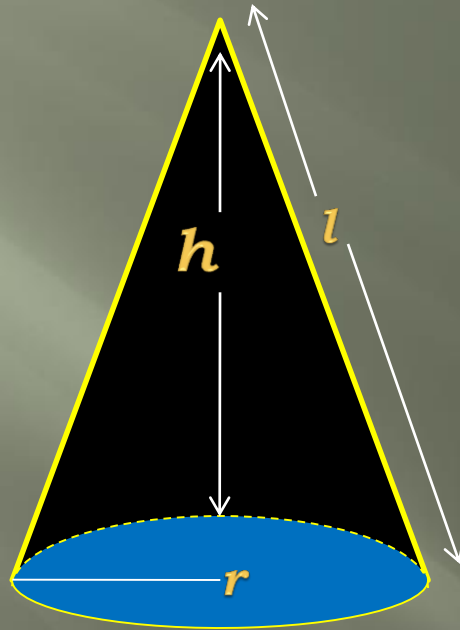
$$= \pi r^2 \times h$$

$$= \pi r^2 h$$



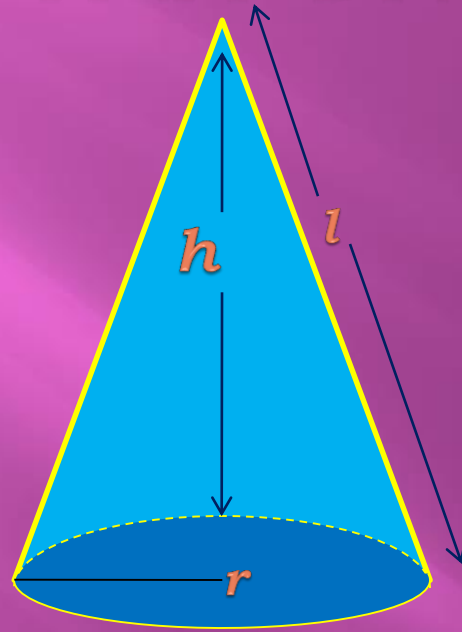
CONE :- A surface generated by a straight line that moves along a closed curve while always passing through a fixed point.

FINDING CURVED SURFACE AREA OF CONE :-



$$= \frac{1}{2} \times l \times 2\pi r$$
$$= \pi r l.$$

FINDING TOTAL SURFACE AREA OF CONE :-

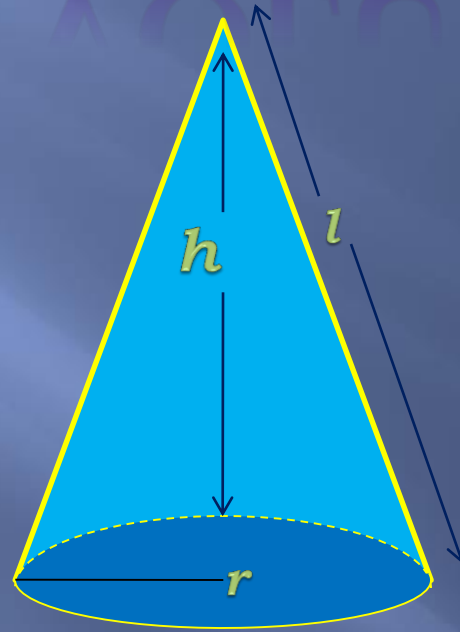


Area of circle = πr^2

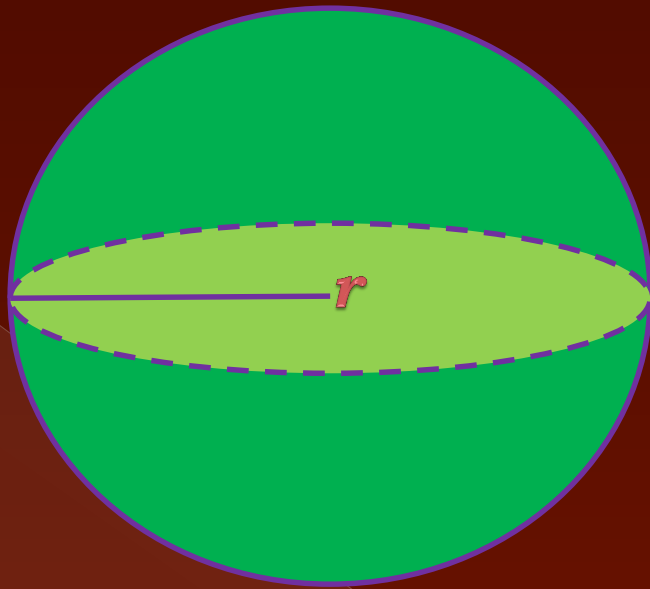
Curved Surface Area = $\pi r l$

Total Surface Area = $\pi r(l + r)$

FINDING VOLUME OF CONE :-

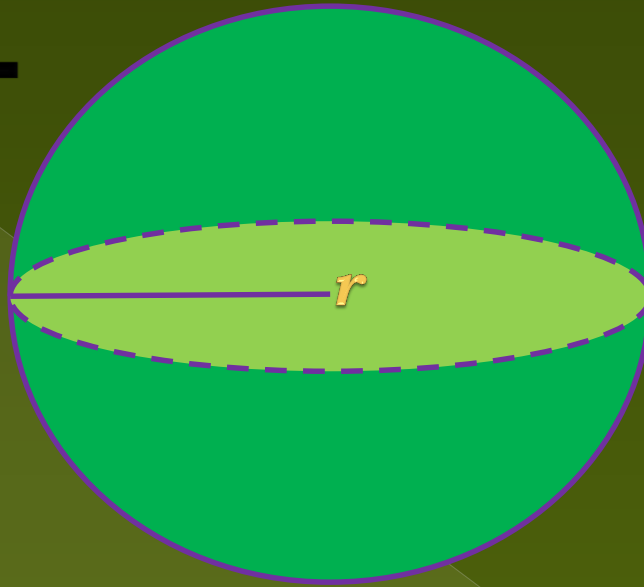


$$= \frac{1}{3} \times \pi r^2 \times h$$
$$= \frac{1}{3} \pi r^2 h$$



SPHERE :- Surface of which every point is the same distance from a fixed point known as the centre. From every aspect it has the same appearance. A sphere may be described by the rotation of a semicircle or circle, about its diameter.

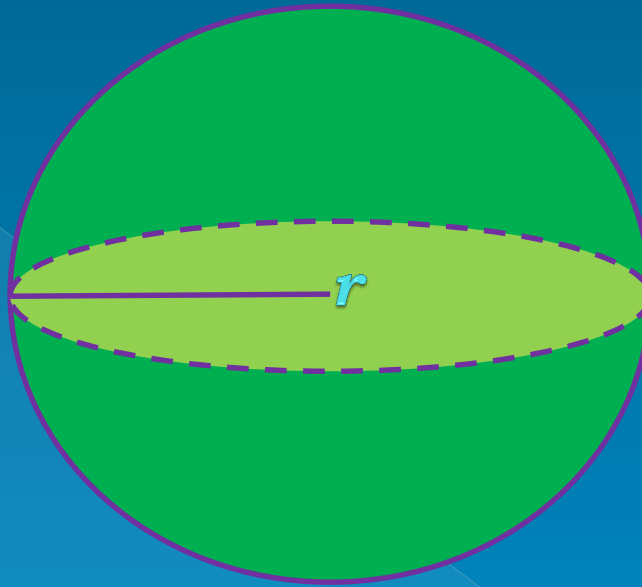
FINDING SURFACE AREA OF SPHERE :-



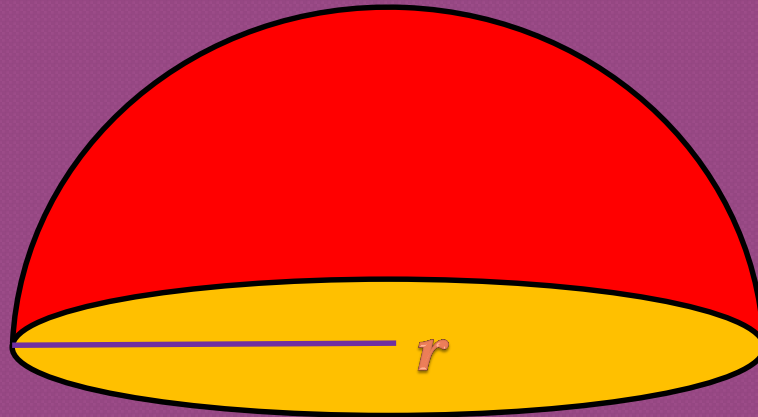
Surface area of sphere = 4 times the area of a circle

So surface area of sphere = $4\pi r^2$

FINDING VOLUME OF SPHERE :-



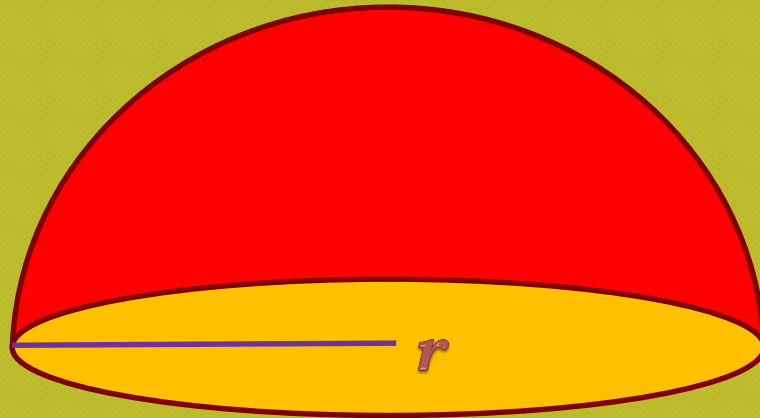
$$\begin{aligned} &= \frac{4}{3} \times \pi r^3 \\ &= \frac{4}{3} \pi r^3 \end{aligned}$$



HEMISPHERE :-

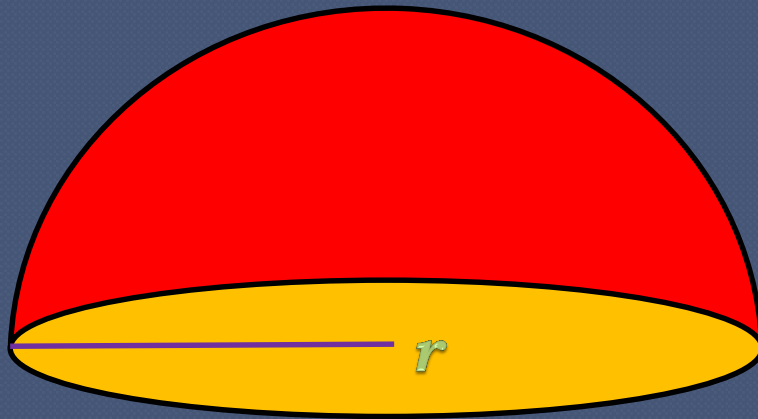
'Hemi' also means 'half'. So When Sphere is Divided into two equal parts Each equal part is called Hemisphere

FINDING CURVED SURFACE AREA OF HEMISPHERE



Curved surface area of hemisphere = twice the area circle
 $= 2 \times \pi r^2$
 $= 2\pi r^2$

TOTAL SURFACE AREA OF HEMISPHERE

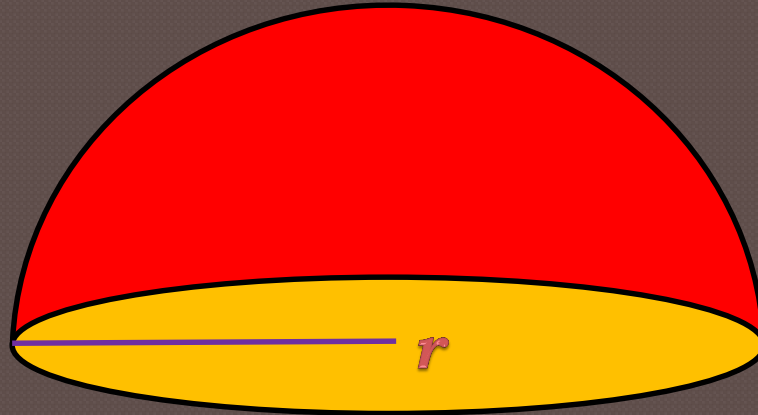


Total surface area of Hemisphere = Thrice the area circle

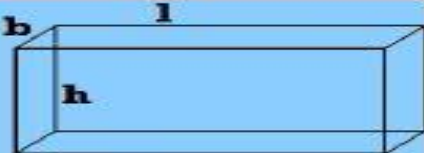
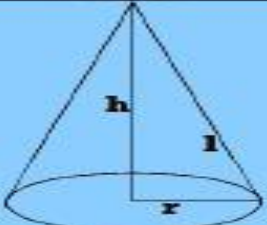
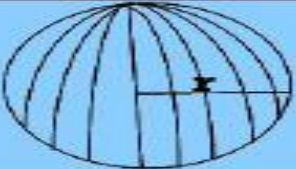
$$= 3 \times \pi r^2$$

$$= 3\pi r^2$$

VOLUME OF HEMISPHERE



$$= \frac{2}{3} \times \pi r^2$$
$$= \frac{2}{3} \pi r^2$$

Name	Figure	Curved Surface Area	Total Surface Area	Volume
Cuboid		$2(l + b)h$	$2(lb + bh + hl)$	lbh
Cube		$4a^2$	$6a^2$	a^3
Right Circular Cylinder		$2\pi rh$	$2\pi r(h + r)$	$\pi r^2 h$
Right Circular Cone		πrl	$\pi r(l + r)$	$\frac{1}{3}\pi r^2 h$
Sphere		$4\pi r^2$	$4\pi r^2$	$\frac{4}{3}\pi r^3$
Solid Hemisphere		$2\pi r^2$	$3\pi r^2$	$\frac{2}{3}\pi r^3$
Hollow Hemisphere		$2\pi r^2$	$2\pi r^2$	$\frac{2}{3}\pi r^3$