Solid Geometry-01

Md. Labu miah

Instructor, P2A

cuboids, cube, cylinder, cone, sphere, Hemisphere

Bricks/Cuboids

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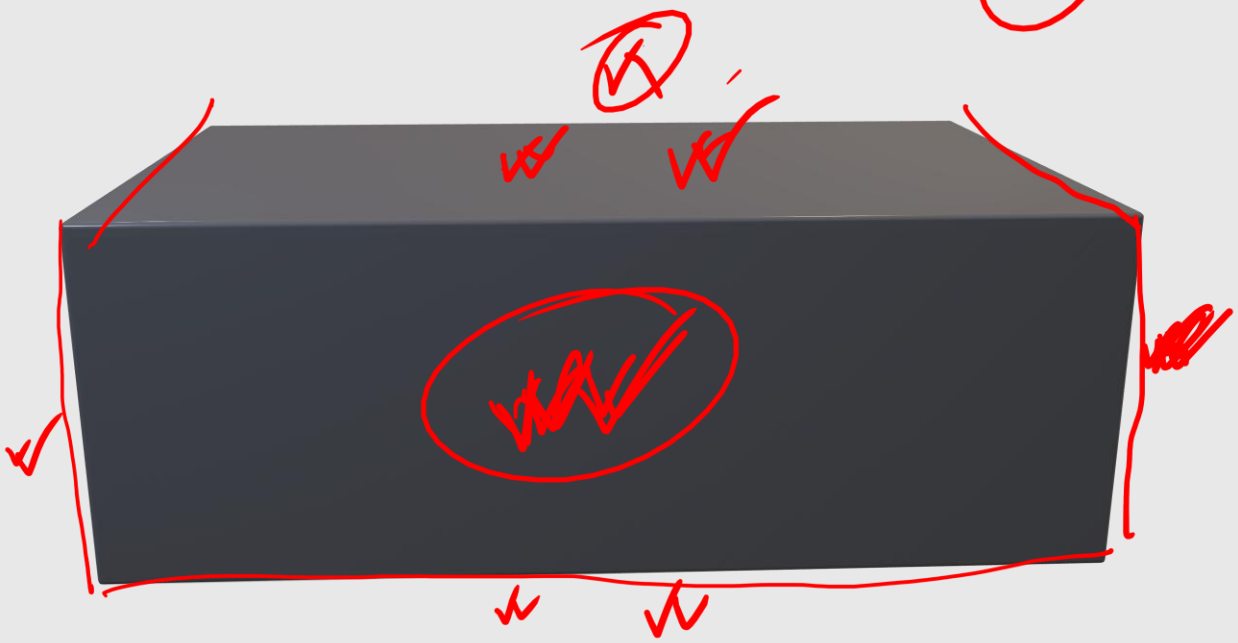
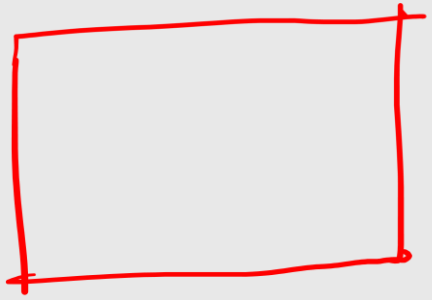


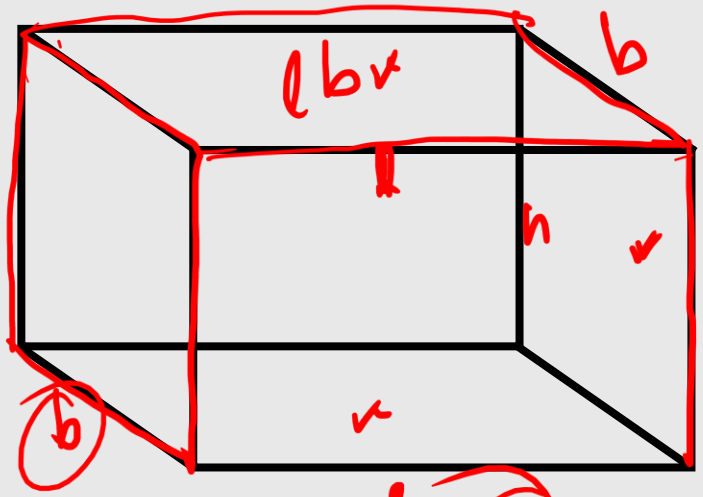

b
l



Total Surface Area of Cuboids

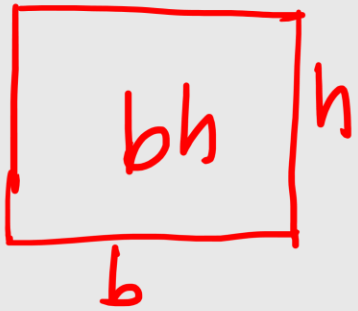
$2(ab + bc + ca)$

$2lb + 2bh + 2lh = 2(lb + bh + lh)$



$2lh$

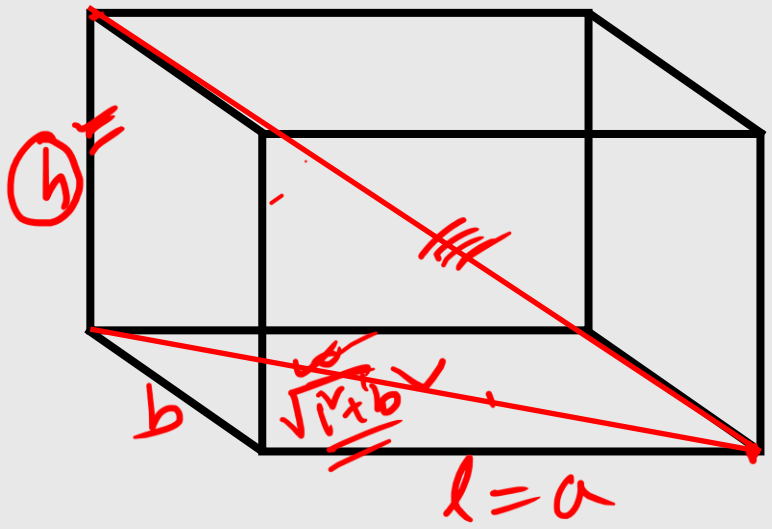
$2lb$



$\Rightarrow$

$2bh$

Diagonal of Cuboids

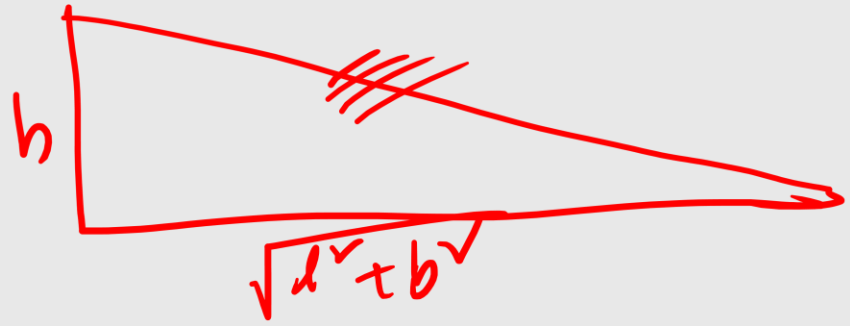


$h = c$

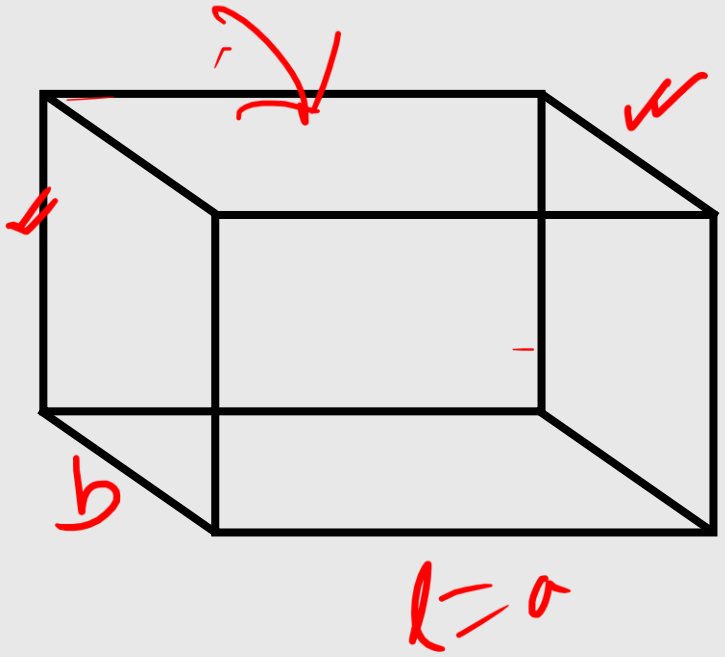
$$\text{Diagonal} = \sqrt{(\sqrt{l^2+b^2})^2 + h^2}$$

$$= \sqrt{l^2+b^2+h^2}$$

$$= \sqrt{a^2+b^2+c^2}$$



Volume of Cuboids



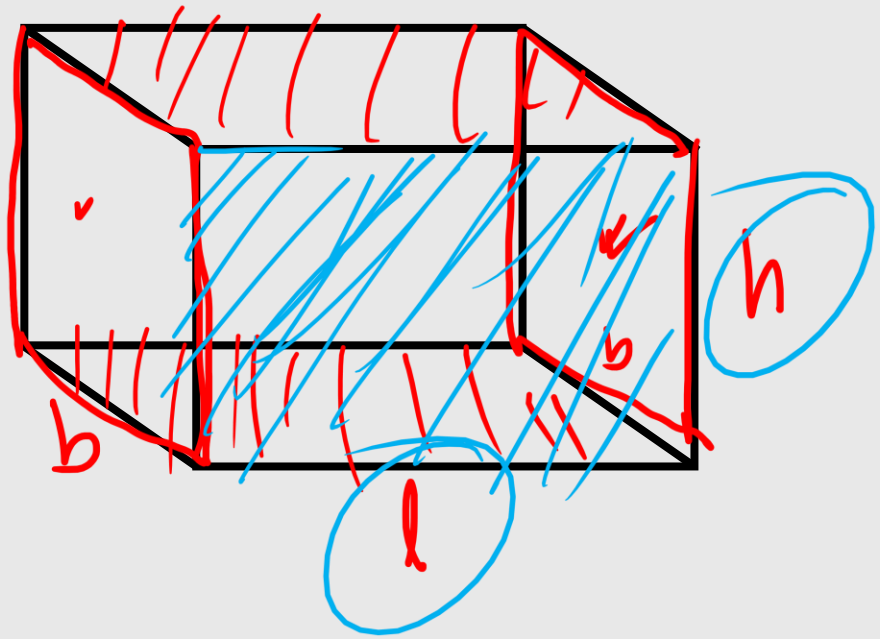
$2(lb + bh + lh)$

$= l \times b \times h$

$= abc$

Area to be four Wall

$2(lb + bh + lh)$

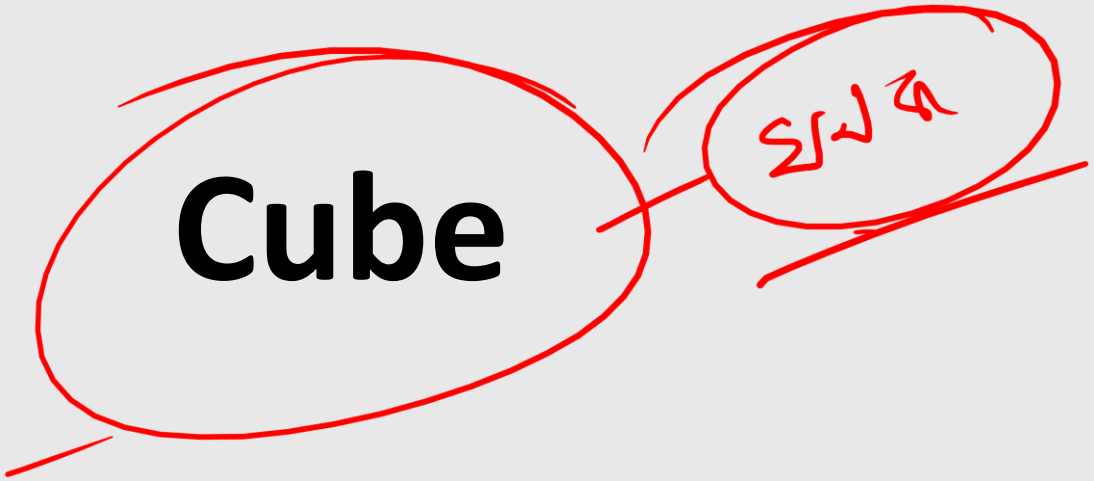


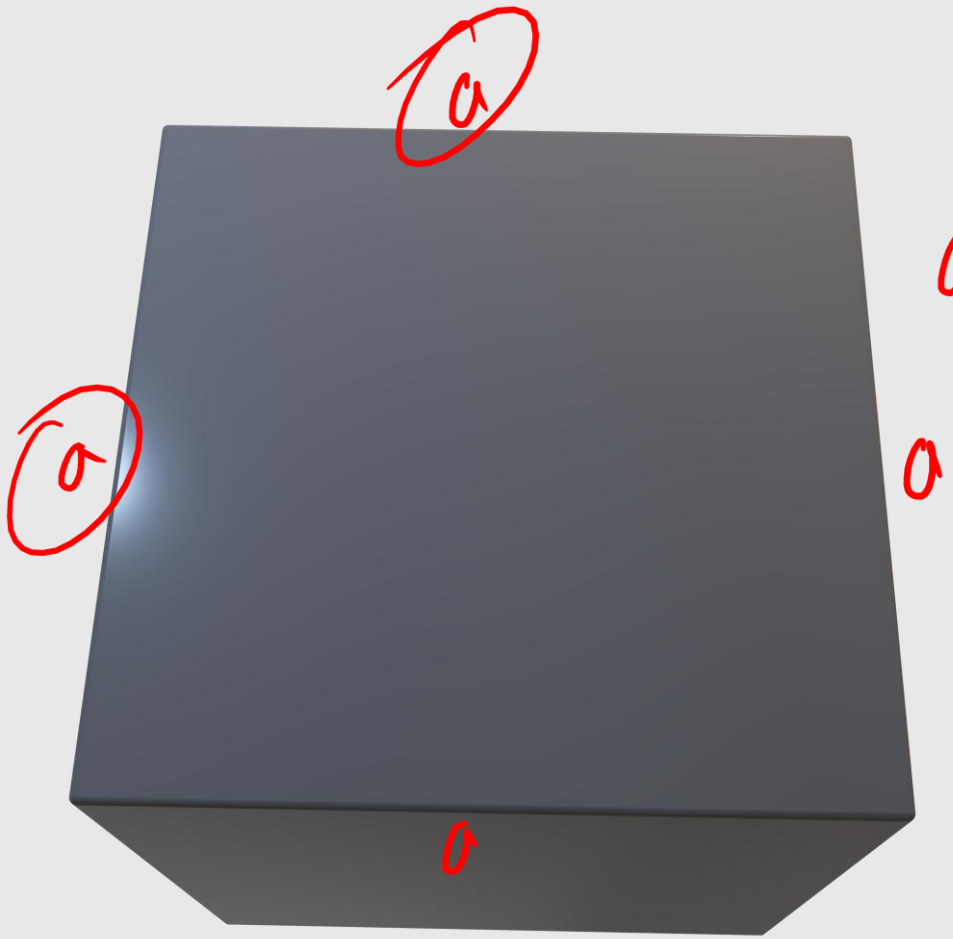
$2bh$

$2lh$

$2bh + 2lh$

$\Rightarrow 2h(l + b)$

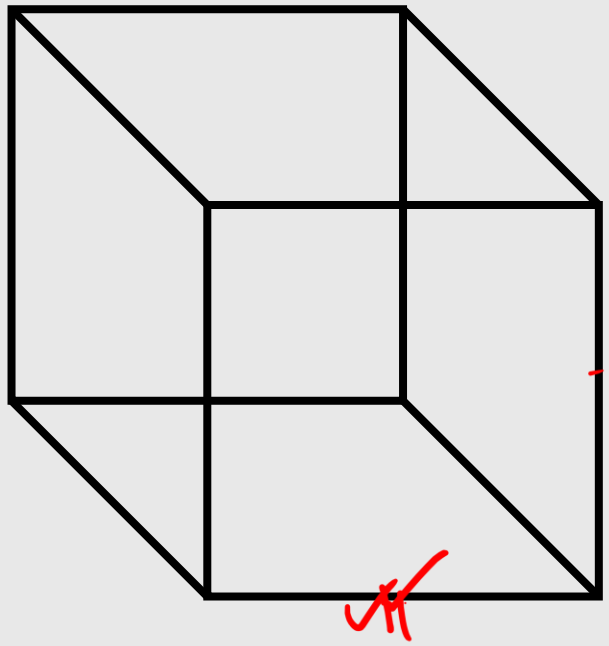

Cube



$a = l = b = h \Rightarrow$ cube

Total Surface Area of Cube

$l = b = h = a$



$= 2(lb + bh + lh)$

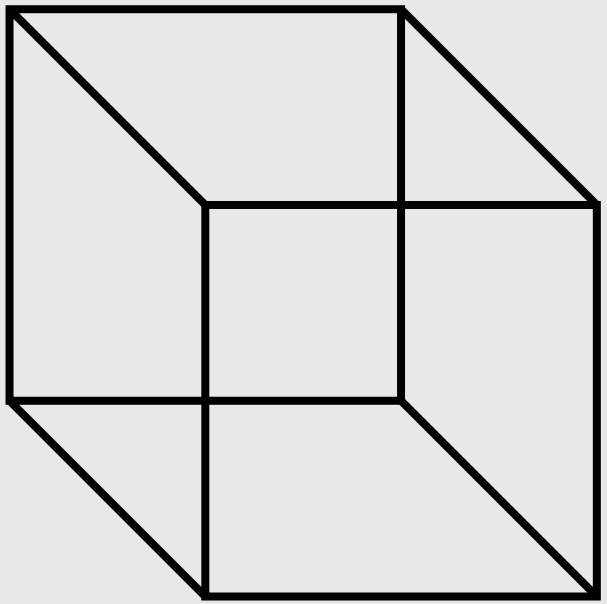
$= 2(a \cdot a + a \cdot a + a \cdot a)$

$= 2(a^2 + a^2 + a^2)$

$= 2(3a^2)$

$= 6a^2$

Diagonal of Cube



$l = b = h = a$

$$= \sqrt{l^2 + b^2 + h^2}$$

$$= \sqrt{a^2 + a^2 + a^2}$$

$$= \sqrt{3a^2}$$

$$= \sqrt{3} \times \sqrt{a^2}$$

$$= \sqrt{3} \times a$$

$$\sqrt{3}a$$

$$= a\sqrt{3}$$

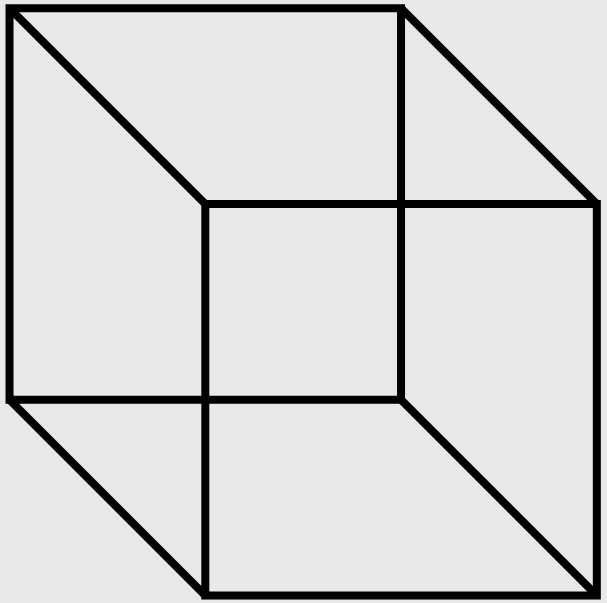
Volume of Cube

$\Rightarrow l = b = h = a$

$l \times b \times h$

$\Rightarrow a \times a \times a$

$= a^3$



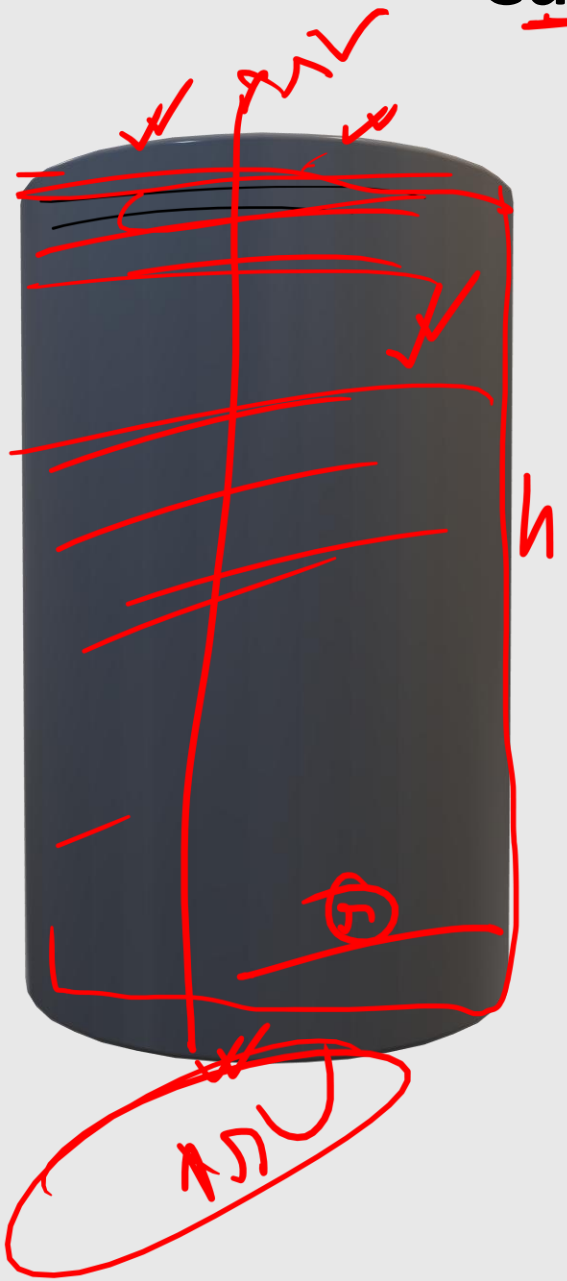
Cylinder (বেলন)

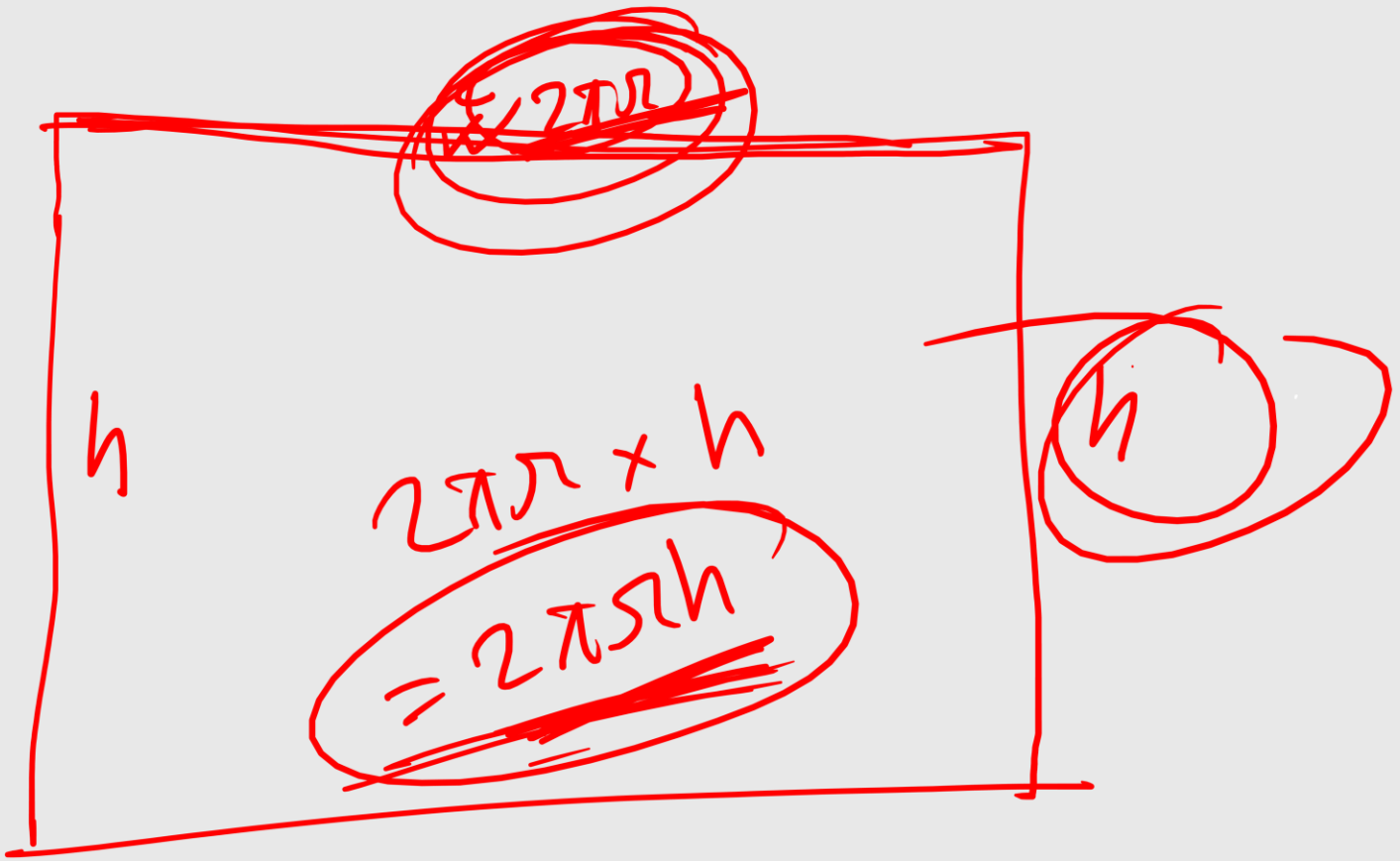
Area of Circular base (ভূমির ক্ষেত্রফল)

πr^2

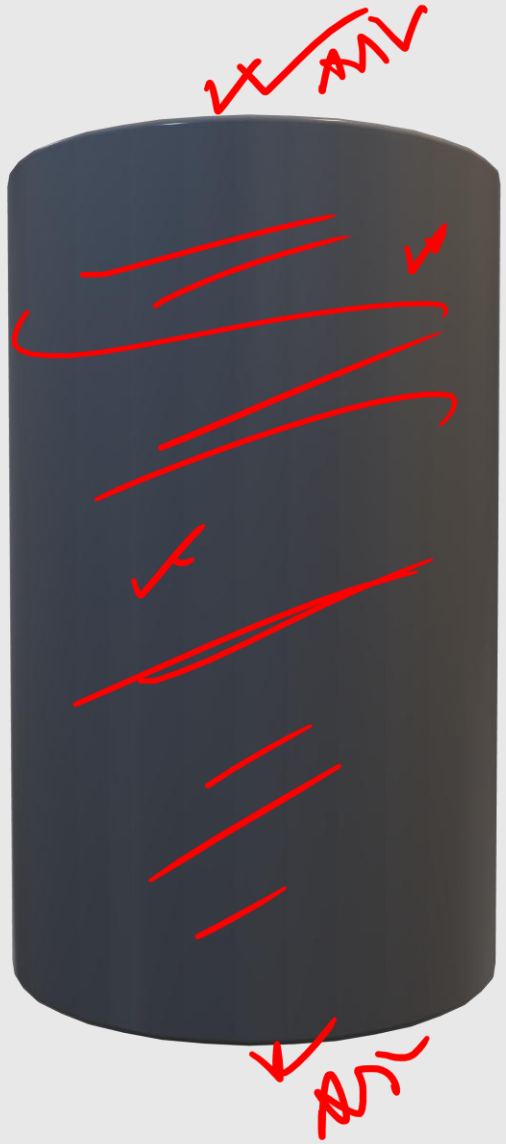
$2\pi rh$

Curved surface area (বক্রতলের ক্ষেত্রফল)





Total surface area (সমগ্রতলের ক্ষেত্রফল)



$2\pi r^2 + 2\pi rh$

$= 2\pi r(r+h)$

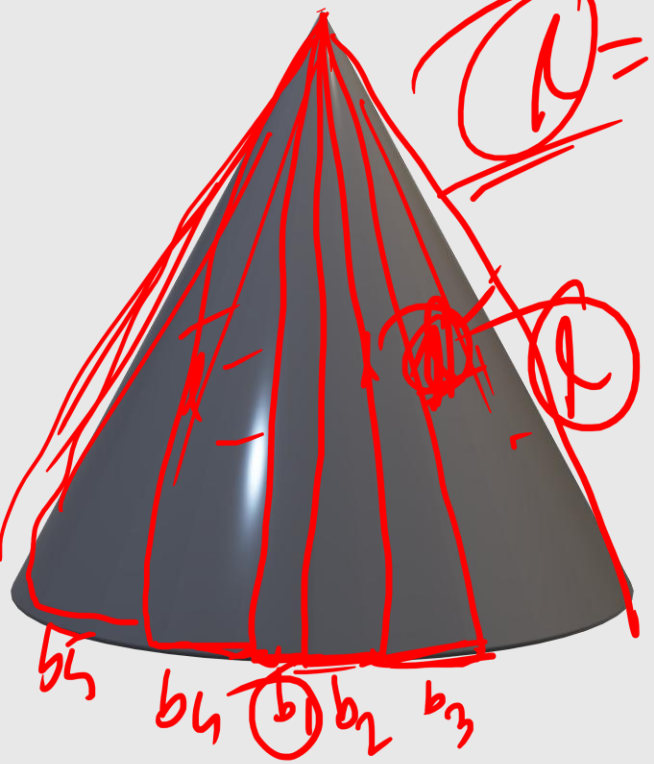
Volume of Cylinder

$\pi r^2 \times h$

$= \pi r^2 h$

Cone (কোণক)

Curved surface area of cone (বক্রতলের ক্ষেত্রফল)



$l = \sqrt{h^2 + r^2}$

$\frac{1}{2} b_1 \times l + \frac{1}{2} b_2 \times l + \frac{1}{2} b_3 \times l$

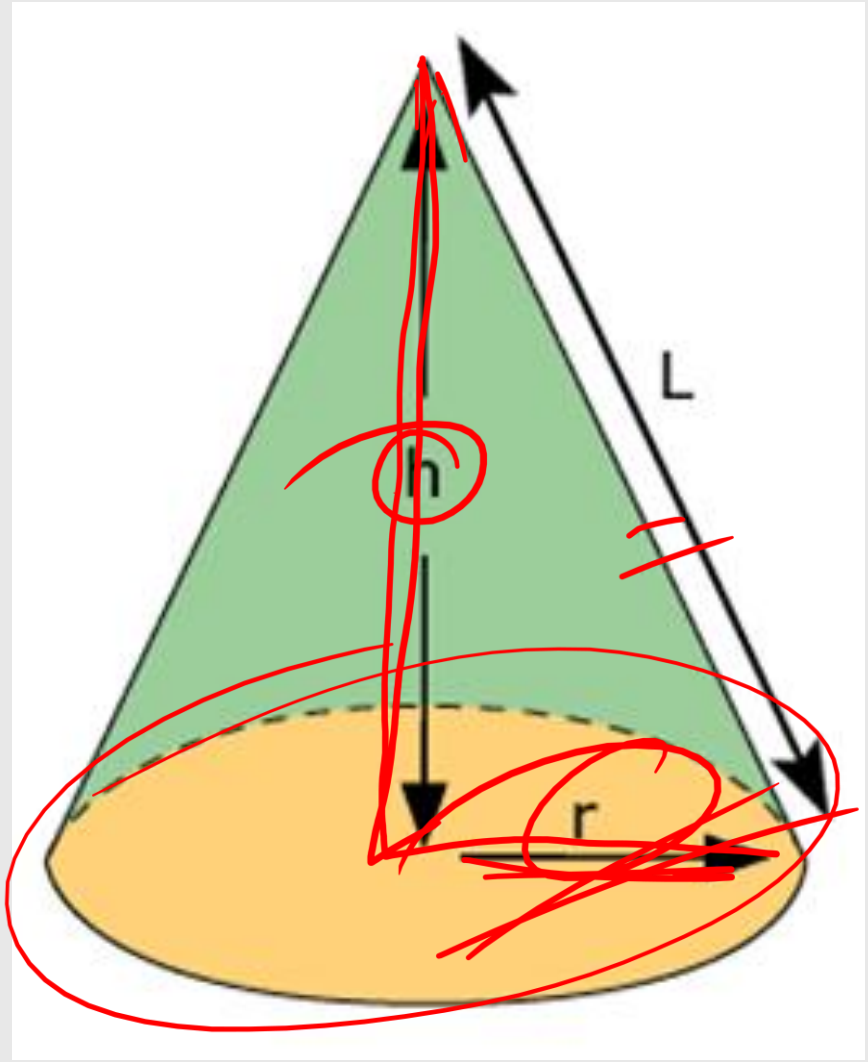
$+ \cdots \cdots + \frac{1}{2} b_n l$

$= \frac{1}{2} l \left(\frac{b_1 + b_2 + b_3 + \cdots \cdots b_n}{2\pi r} \right)$

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

$= \pi r l$

Slant Height (হেলানো তলের দৈর্ঘ্য)



$$l^2 = h^2 + r^2$$

$$l = \sqrt{h^2 + r^2}$$

Total surface area (সমগ্রতলের ক্ষেত্রফল)

$\pi r^2 + \pi r l$

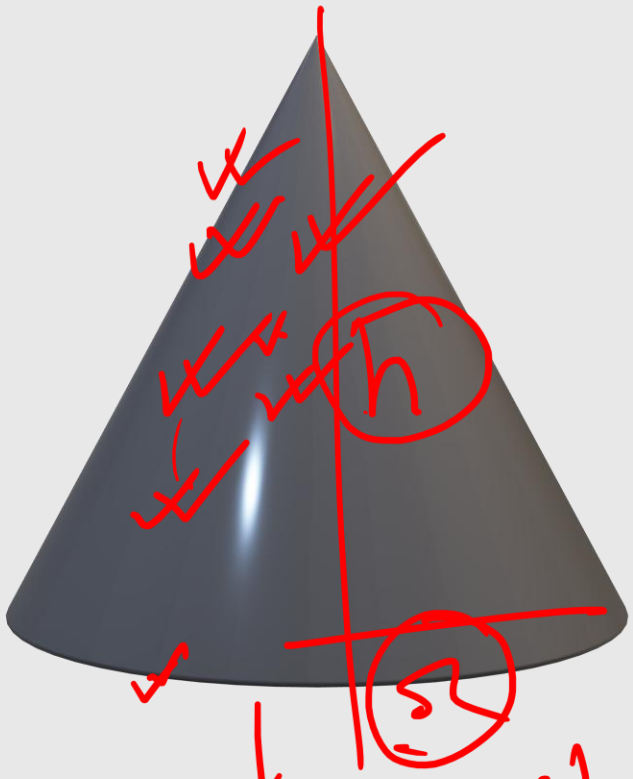
$= \pi r (r + l)$

cone

$2\pi r (r + h)$

cylinder

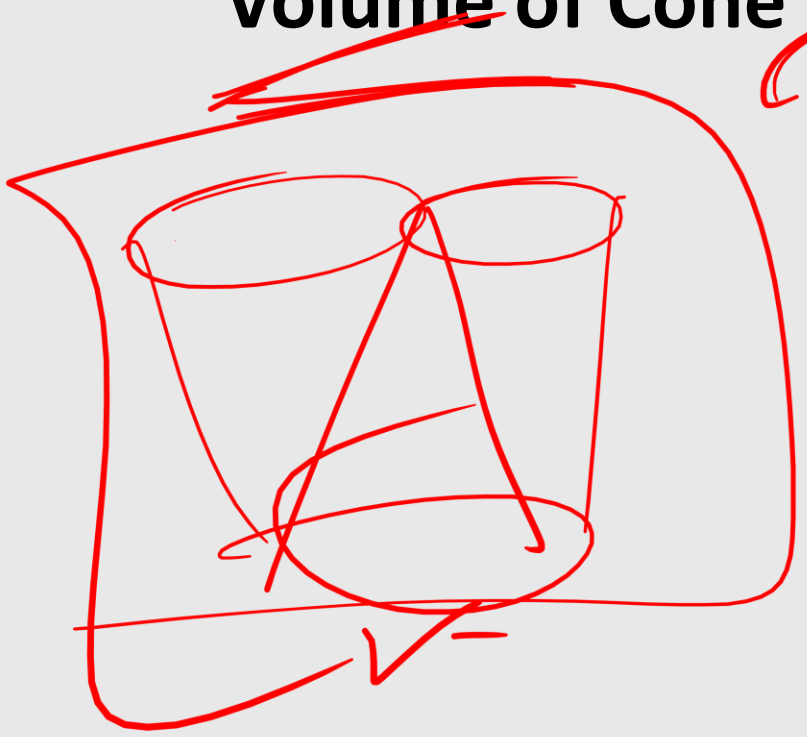
Volume of Cone

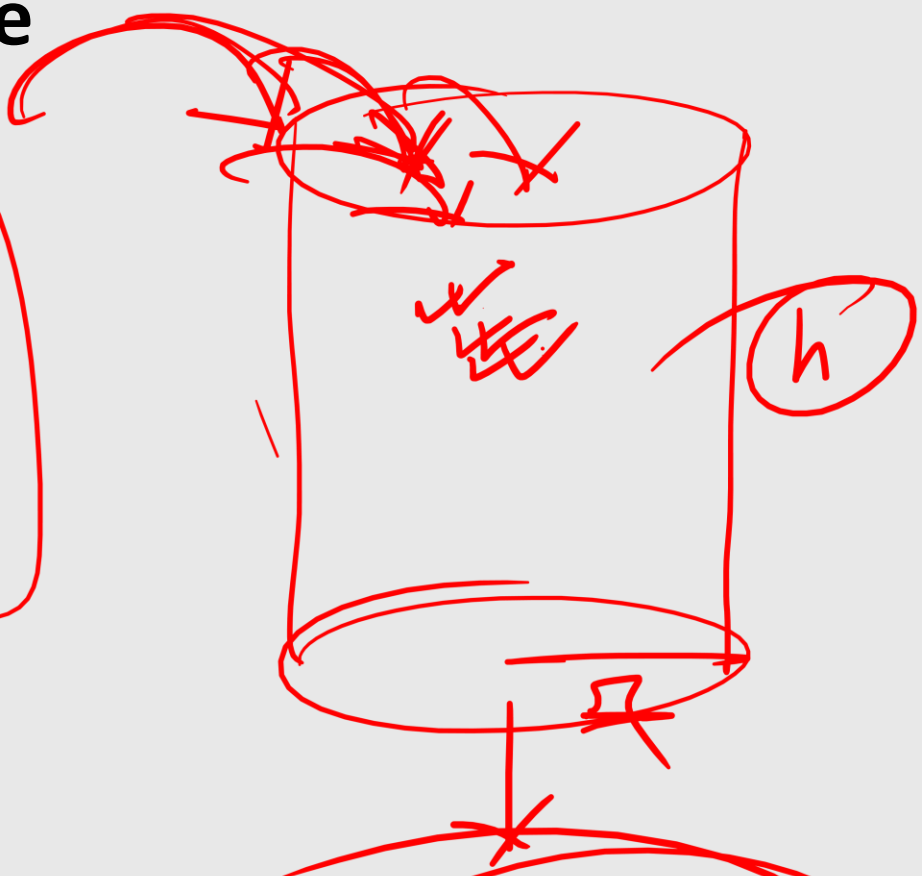


$\pi r^2 h$

$\frac{\pi r^2 h}{3}$

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

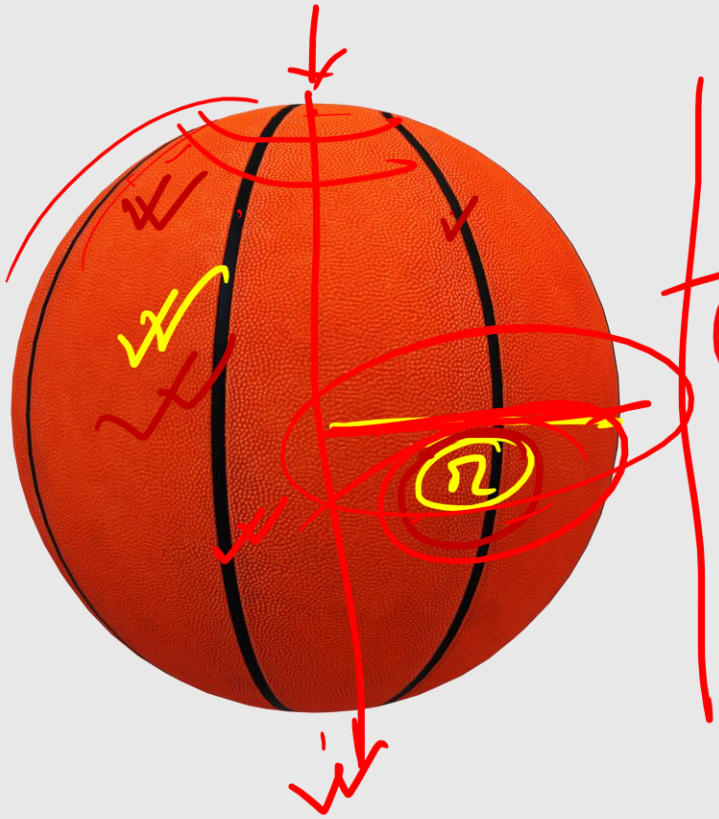




$\pi r^2 h$

Sphere (গোলক)

Surface area of Sphere



r

h

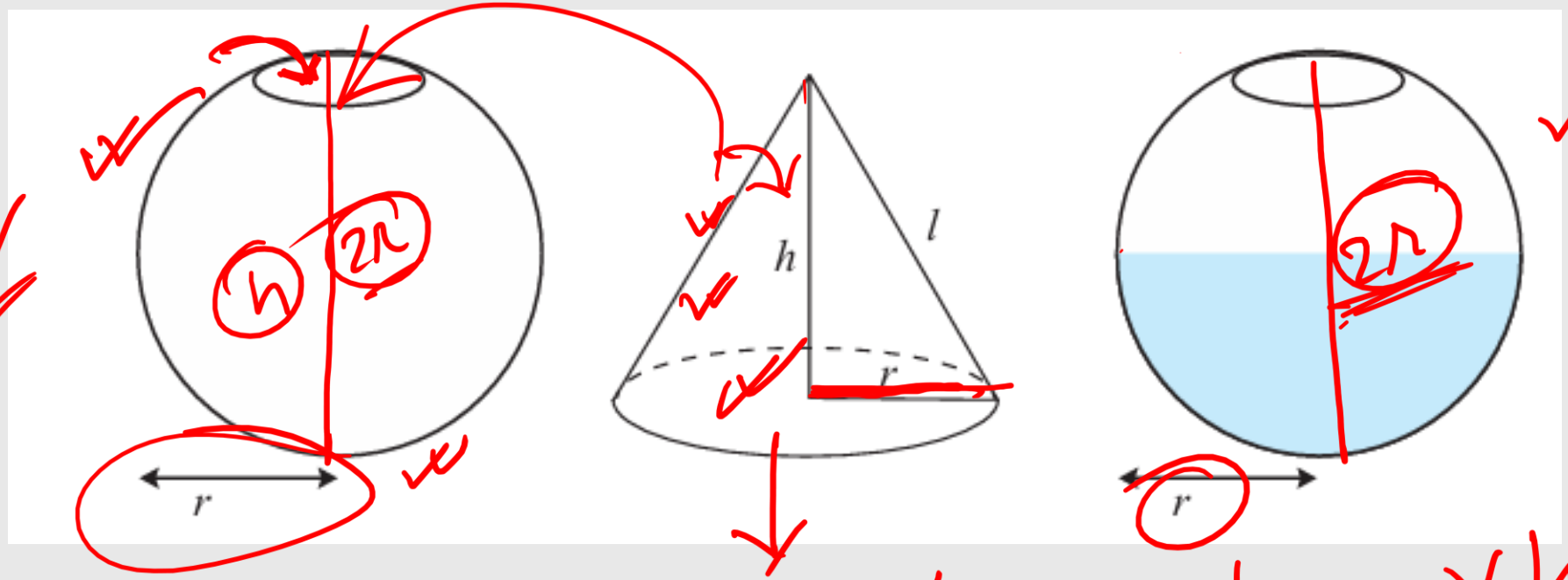
4 circles

$4\pi r^2$

$4\pi r^2$

Volume of Sphere

$\frac{4}{3}\pi r^3$



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

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

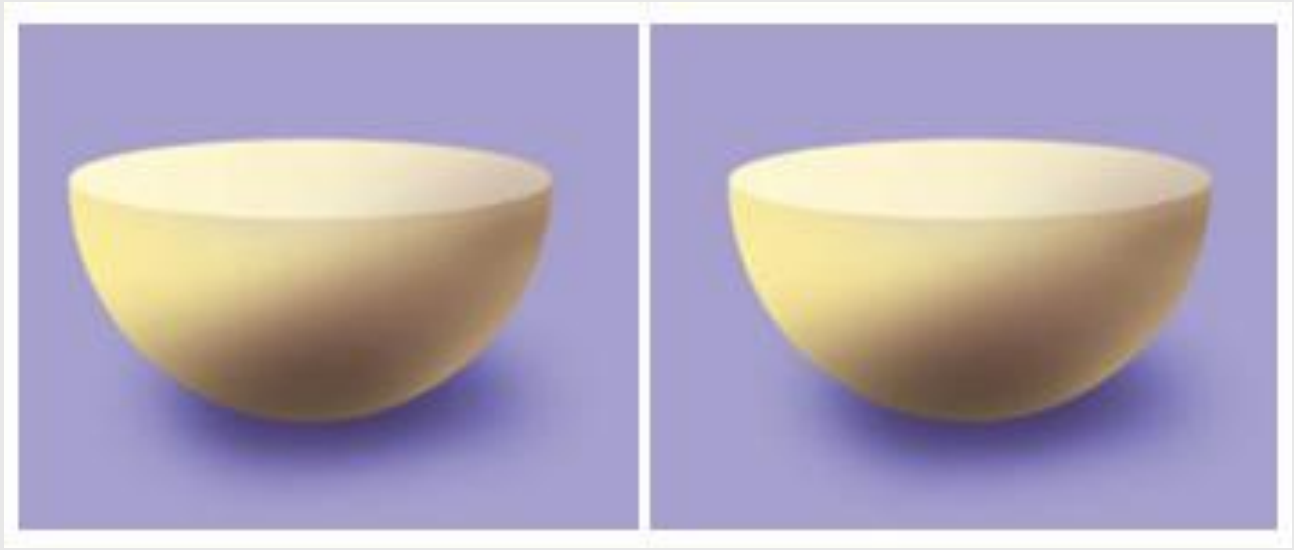
Hemisphere (অর্ধগোলক)

$4\pi r^2$

$2\pi r^2$

$2\pi r^2$

Hemisphere

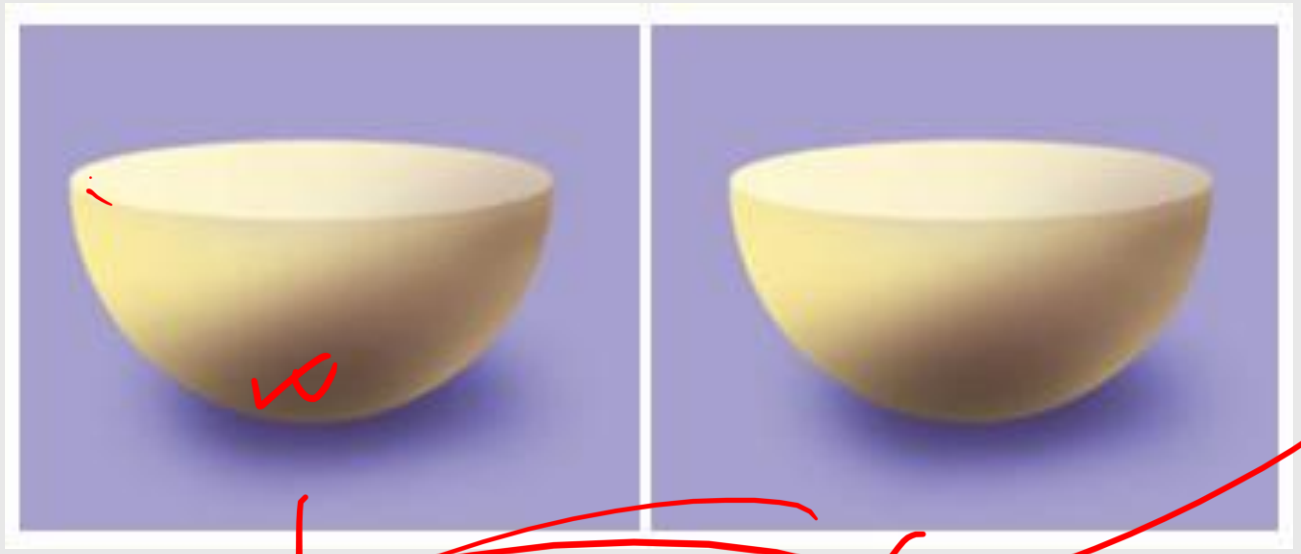


Surface area of Hemisphere

$$= 2\pi r^2 + \pi r^2$$

$$= 3\pi r^2$$

Volume of Hemisphere



$$\frac{\frac{4}{3}\pi r^3}{2}$$

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

Cuboids

- Length (l), Breadth (b) & Hieght (h).
- Volume: lbh
- Surface Area: $2(lb + bh + lh)$ $= 2(ab + bc + ca)$
- Diagonal: $\sqrt{l^2 + b^2 + h^2}$

Cube

- Volume: a^3
- Surface Area: $6a^2$
- Diagonal: $\sqrt{3}a$ $= a\sqrt{3}$

Cylinder

Height or Length $=$ h & **Radius of base** $=$ r

- Curved Surface Area : $2\pi rh$
- Total Surface Area: $2\pi r(r+h)$
- Volume: $\pi r^2 h$

Cone

Height or Length $= h$, **Radius of base** $= r$ Slant height $= l$

- Slant height, $l = \sqrt{h^2 + r^2}$
- Curved Surface Area : $\pi r l$
- Total Surface Area: $\pi r(l + r)$
- Volume: $\frac{1}{3}\pi r^2 h$

Sphere

- Surface Area: $4\pi r^2$
- Volume: $\frac{4}{3}\pi r^3$

Hemisphere

- Curved Surface Area: $2\pi r^2$
- Total Surface Area: $3\pi r^2$
- Volume: $\frac{2}{3}\pi r^3$

Thank You