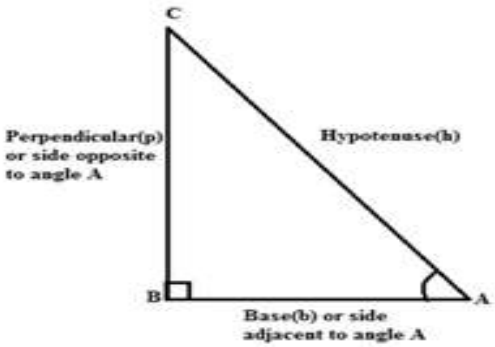
Geometry Formulas

3.1. Right Triangle



Area of a right triangle=$\frac{1}{2}$ bh

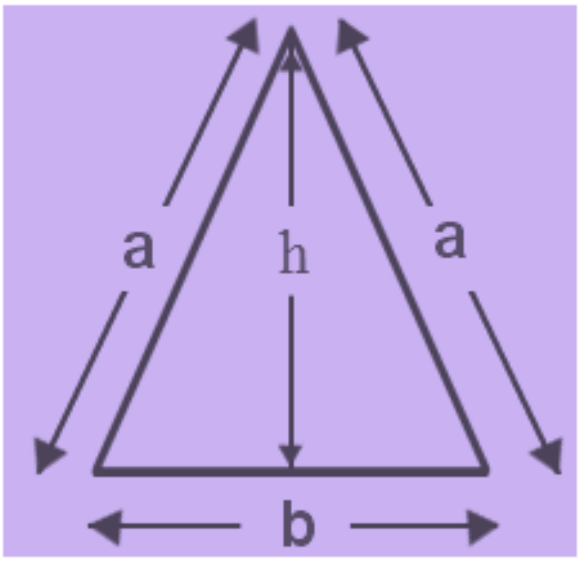
Perimeter of a right triangle = a+b+c

Pythagoras Theorem = Hypotenuse^2 = Perpendicular^2 + base^2

Where, b is the base of a triangle

h is the height of the triangle

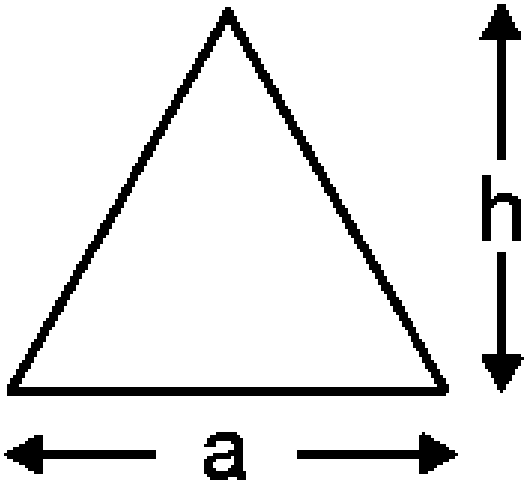
3.2. Isosceles Triangle



Area of Isosceles Triangle Formula=$\frac{1}{2}$ bh

Altitude of an Isosceles Triangle= $\sqrt{a^2 - \frac{b^2}{4}}$

3.3. Equilateral Triangle



Area of an Equilateral Triangle = $\frac{\sqrt{3}}{4}a^2$

Perimeter of an Equilateral Triangle=3a

Semi Perimeter of an Equilateral Triangle =3a / 2

Height of an Equilateral Triangle== $\frac{\sqrt{3}}{2}a$

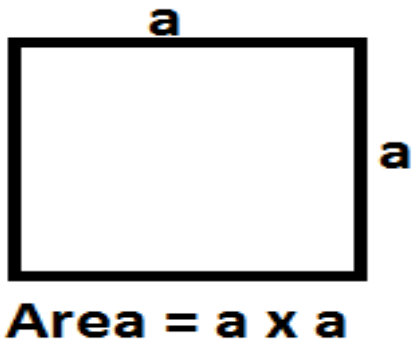
3.4. Scalene Triangle

Area of Triangle = ½ x b x h

When all the sides are given , $A = \sqrt{s(s-a)(s-b)(s-c)}$

Where s = (a+b+c)/2

3.5. Square



Area of a Square=a^2

Perimeter of a Square (p) =4a

3.6. Rectangle

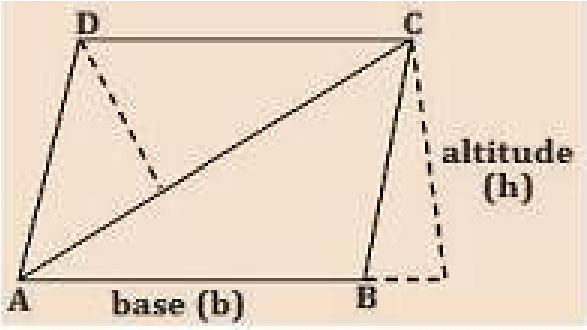
Rectangle

Area of a Rectangle, A = l × b

Perimeter of a Rectangle, P = 2 (l + b)

Diagonal of a Rectangle, D = $\sqrt{l^2 + b^2}$

3.7. Parallelogram



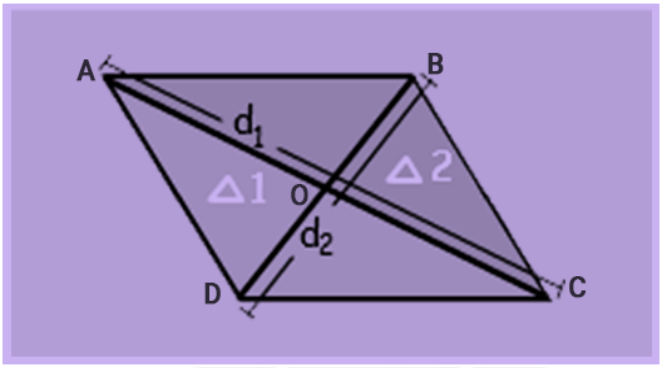
Area = b × h

Perimeter of a Parallelogram=2(Base+Height)

Height of a Parallelogram, Height=Area/Base

Diagonal of Parallelogram =$p^2+q^2=2(a^2+b^2)$

3.8. Rhombus



Area of a Rhombus = $\frac{d_1 d_2}{2}$

d_1 is the length of a diagonal

d_2 is the length of the other diagonal

Perimeter of a rhombus = 4 × a

Where,

a is the side.

Area = 4 x ½ (ab)

Where,

b is the length of the base

a is the altitude (height).

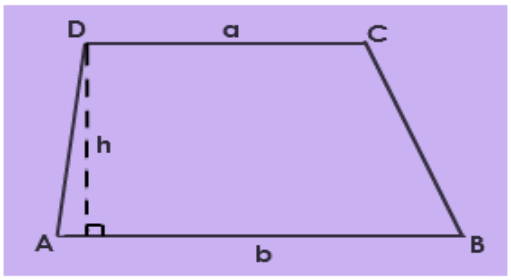
Area = Sin^2 sinx

s is the length of any side

x is an interior angle

sin is the sine function

3.9. Trapezoid



Area of a Trapezoid = $\frac{a+b}{2}h$

Perimeter of a Trapezoid, P=a+b+c+d

Perimeter of a Trapezoid

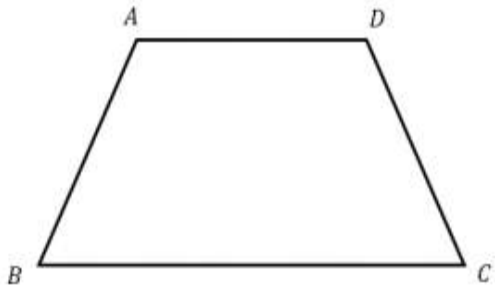
h = height (**Note** – This is the perpendicular height, not the length of the legs.)
a = the short base
b = the long base

Height (altitude) = $2a/(b_1 + b_2)$

Base length = (2a/h) – b

Centroid of a Trapezoid, $x = \frac{b+2a}{3(a+b)}h$

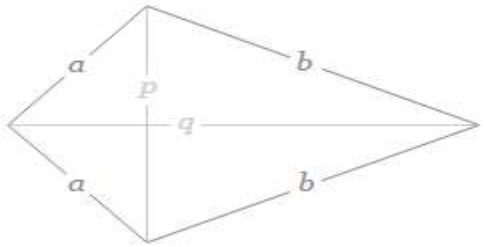
3.10. Isosceles Trapezoid



Area of Isosceles Trapezoid $=\frac{a+b}{2}h$

Perimeter of Isosceles Trapezoid =a+b+2c

3.13. Kite



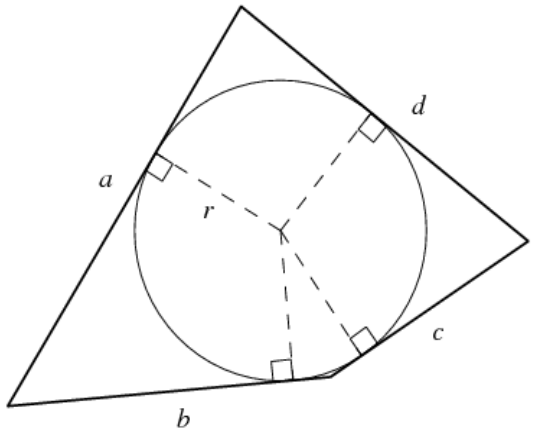
Area of a Kite= (1 ⁄ 2) × Diagonal

Perimeter of a Kite= 2a+2bWhere,
a = The length of First pair
b = The length of second pair

3.14. Cyclic Quadrilateral

Cyclic Quadrilateral = $\sqrt{(s-a)(s-b)(s-c)(s-d)}$
Where s is called the semi-perimeter,
s = (a + b +c + d) / 2

3.15. Tangential Quadrilateral



Area=$\sqrt{abcd}$ (or)

A=rs

Where,
r = radius of inscribed circle
s = semi-perimeter = *(a + b + c + d)*

3.16. General Quadrilateral

Area of a Square = $(\text{side})^2$

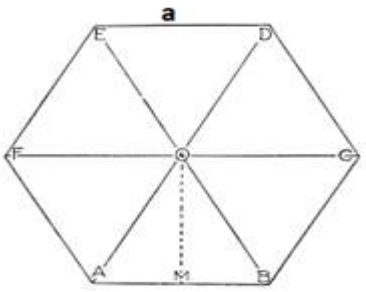
Area of a Kite = (1 / 2) × Diagonal

Area of a Parallelogram = Base × Height

Area of a Rectangle= Base × Height

Area of a Trapezoid= $\frac{\text{base1}+\text{base2}}{2}\text{h}$

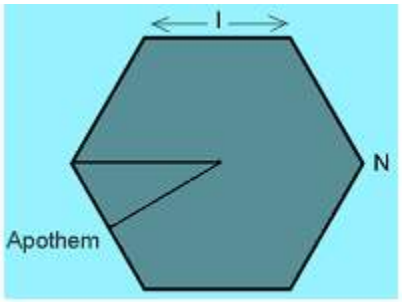
3.17. Regular Hexagon



Area of hexagon = $\frac{3\sqrt{3}}{2}a^2$

Where a is the length of each side of the hexagon

3.18. Regular Polygon

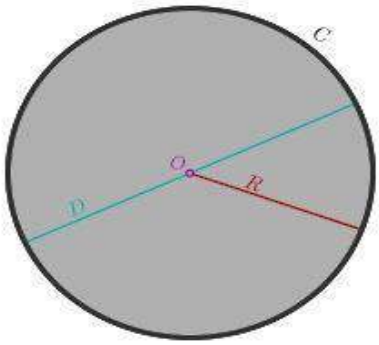


The formula for area of a regular polygon is given as,

A = $\frac{l^2 n}{4tan\frac{\pi}{n}}$

Where,
l is the side length
n is the number of sides

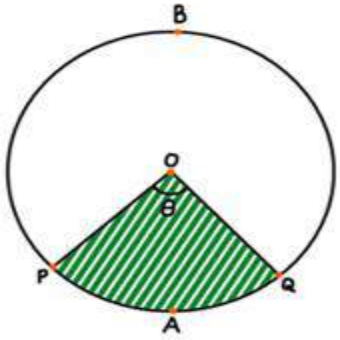
3.19. Circle



Area of a Circle = πr^2
Circumference of a circle =$2\pi r$

Where,
r is the radius of the circle.
d is the diameter of the circle.
C is the circumference of the circle.

3.20. Sector of a Circle

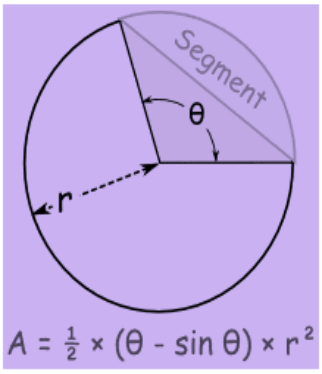


Area of sector = $\frac{\theta}{360^0}\pi r^2$

Length of an arc of a sector== $\frac{\theta}{360^0}2\pi r$

Where, r is the circle radius

3.21. Segment of a Circle

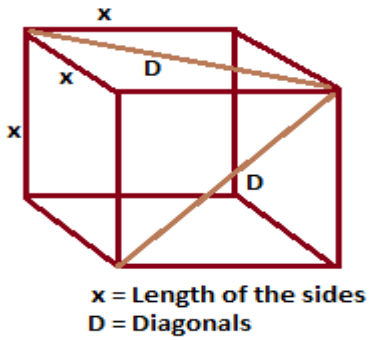


Area of a Segment in Radians = $A = \frac{1}{2}r^2(\theta - sin\theta)$

Area of a Segment in Degrees= $A = \frac{1}{2}r^2(\frac{\pi}{180}\theta - sin\theta)$

Where, r is the radius of a circle

3.22. Cube



Surface area of Cube=$6x^2$

Volume of a cube = x^3

Diagonal of a Cube = $\sqrt{3}x$

Where,

x is the side length of the cube.

The Cube Formula for any value 'x' is given as,

$x^3 = x \times x \times x$

3.23. Rectangular Parallelepiped

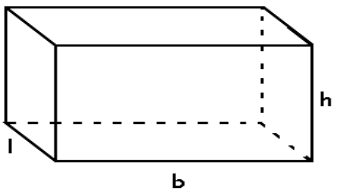
Surface area = 2ab+2bc+2ac

Volume = abc

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

3.24. Prism

Rectangular Prism



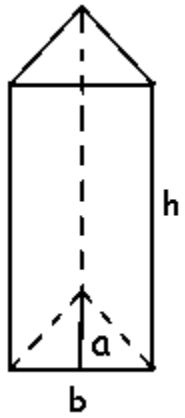
Surface Area of a Rectangular Prism = 2(bl+lh+hb)

Volume of a Rectangular Prism=lbh

Base Area of a Rectangular Prism =bl

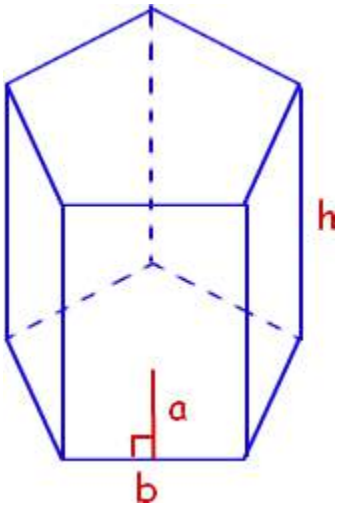
Where,
b – base length of the rectangular prism.
l – base width of the rectangular prism.
h – height of the rectangular prism.

Triangular Prism



Surface Area of a triangular Prism= ab +3bh
Volume of triangular prism=$\frac{1}{2}$abh
Base area of a Triangular Prism =12ab
Where,
a – apothem length of the prism.
b – base length of the prism.
l – base width of the rectangular prism.
h – height of the prism.

Pentagonal Prism



Surface Area of a pentagonal Prism = 5ab+5bh

Volume of a Pentagonal Prism=$\frac{5}{2}$abh

Base Area of Pentagonal Prism=$\frac{5}{2}$ab

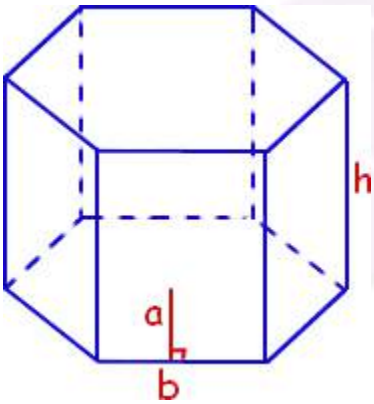
Where,

a – apothem length of the pentagonal prism.

b – base length of the pentagonal prism.

h – height of the pentagonal prism.

Hexagonal Prism



Surface Area of a hexagonal Prism = 6ab +6bh

Volume of a HexagonalPrism=3abh

Base area of hexagonal prism=3a

Where,

a – apothem length of the hexagonal prism.

b – base length of the hexagonal prism.

h – height of the hexagonal prism.

3.25. Regular Tetrahedron

Area of One Face of Regular Tetrahedron, $A = \frac{1}{4}\sqrt{3}a^2$

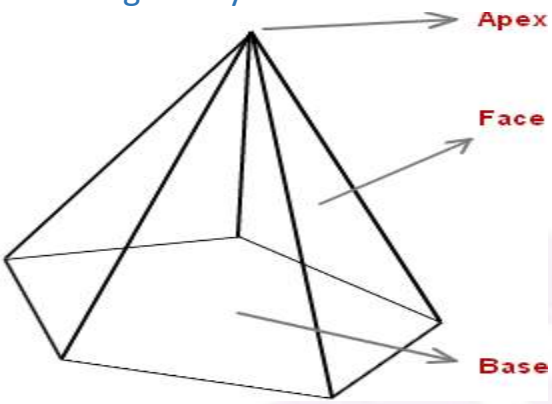
Total Surface Area of Regular Tetrahedron $A = \sqrt{3}a^2$

Slant Height of a Regular Tetrahedron = $a\frac{\sqrt{3}}{2}$

Altitude of a Regular Tetrahedron, $h = \frac{a\sqrt{6}}{3}$

Volume of a Regular Tetrahedron, $v = \frac{a^3\sqrt{2}}{12}$

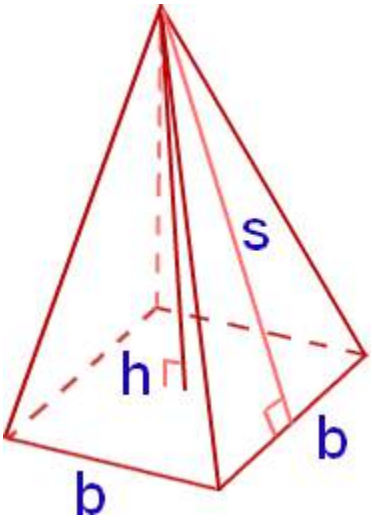
3.26. Regular Pyramid



Surface Area of a Pyramid=Base Area +$\frac{1}{2}$(Number of Base Sides× Slant Height × Base Length)

Volume of a Pyramid=$\frac{1}{2}$×Base Area ×Height

Square Pyramid



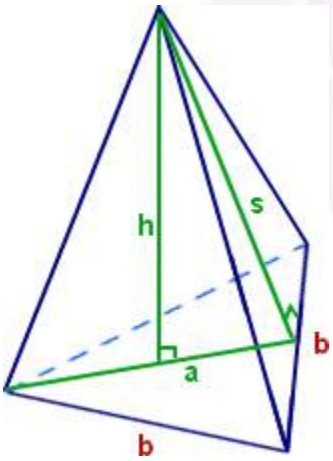
Surface Area of a Square Pyramid=$2bs+b^2$

Volume of a Square Pyramid = $\frac{1}{3}b^2h$

Base Area of a Square Pyramid=b^2

Where,
b – base length of the square pyramid.
s – slant height of the square pyramid.
h – height of the square pyramid.

Triangular Pyramid



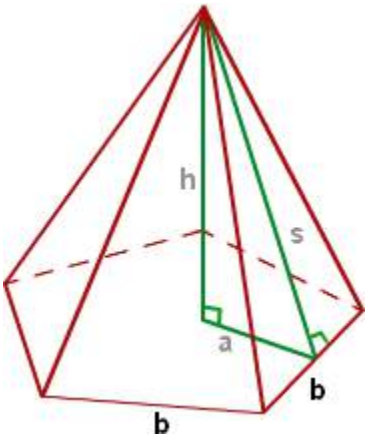
Surface Area of a Triangular Pyramid=$\frac{1}{2}ab+\frac{3}{2}bs$

Volume of a Triangular Pyramid=$\frac{1}{6}abh$

Base Area of a Triangular Pyramid=$\frac{1}{2}$ab

Where,
a – apothem length of the triangular pyramid.
b – base length of the triangular pyramid.
s – slant height of the triangular pyramid.
h – height of the triangular pyramid

Pentagonal Pyramid



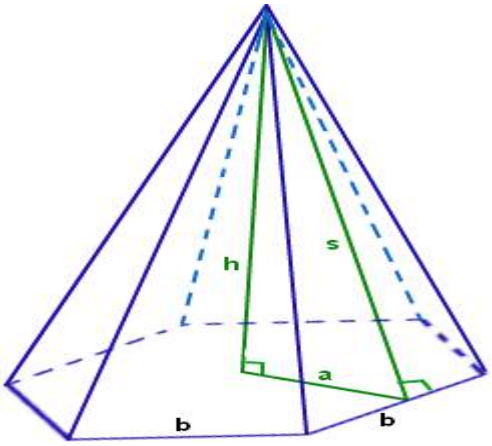
Surface Area of a Pentagonal Pyramid=$\frac{5}{2}$ab+$\frac{5}{2}$bs

Volume of a Pentagonal Pyramid=$\frac{5}{6}$abh

Base Area of a Pentagonal Pyramid=$\frac{5}{2}$ab

Where,
a – apothem length of the pentagonal pyramid.
b – base length of the pentagonal pyramid.
s – slant height of the pentagonal pyramid.
h – height of the pentagonal pyramid.

Hexagonal Pyramid



Surface Area of a Hexagonal Pyramid=3ab+3bs

Volume of a Hexagonal Pyramid=abh

Base Area of a Hexagonal Pyramid=3ab

Where,
a – Apothem length of the hexagonal pyramid.
b – Base length of the hexagonal pyramid.
s – Slant height of the hexagonal pyramid.
h – Height of the hexagonal pyramid.

3.27. Frustum of a Regular Pyramid

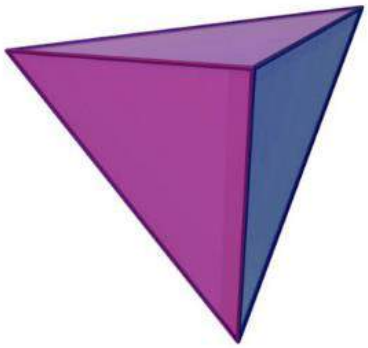
Volume of Frustum of a Regular Pyramid, V = $\frac{h(B_1+B_2+\sqrt{B_1B_2})}{3}$

Lateral Surface of Frustum of a Regular Pyramid, S = $\frac{s(P_1+P_2)}{2}$

Where,
s = Slant height
P_1 and P_2 = Perimeter of Bases
h=Height
B_1 and B_2 = Base Areas

3.28. Platonic Solids

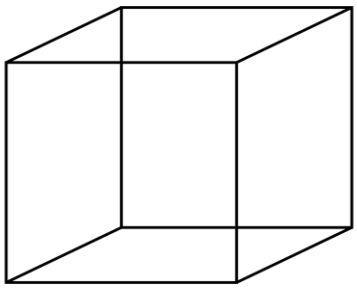
Tetrahedron



Surface Area = $\sqrt{3}a^3$

Volume=$\frac{\sqrt{2}}{12}a^3$

Cube

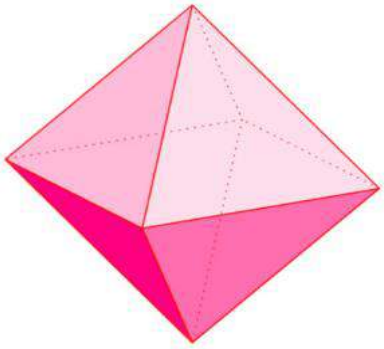


Surface Area = $4a^2$

Volume = a^3

Diagonal = $\sqrt{3}a$

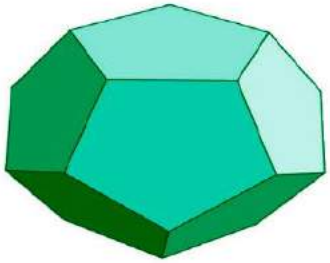
Octahedron



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

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

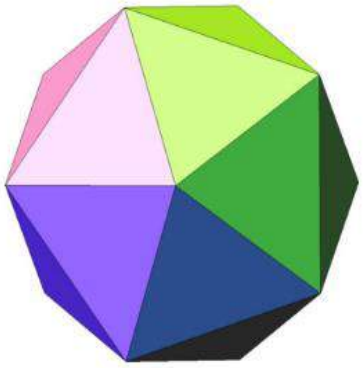
Dodecahedron



Surface Area = 30 × a × ap

Volume=$\frac{1}{4}(15+7\sqrt{5})a^3$

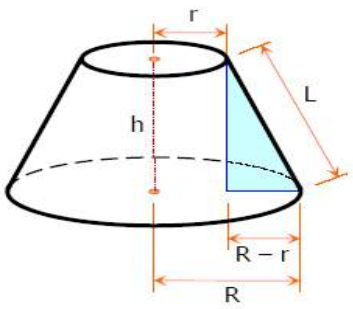
Icosahedron



Surface Area=$5\sqrt{3}a^2$

Volume = $\frac{5}{12}(3+\sqrt{5}a^3)$

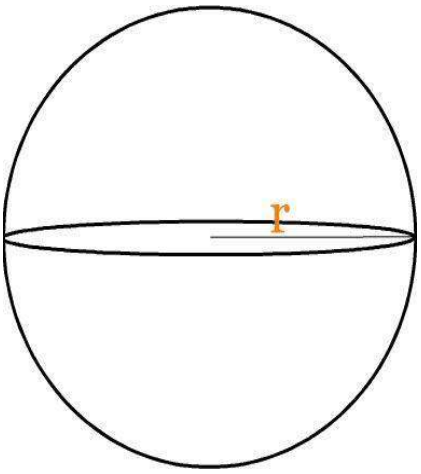
3.33. Frustum of a Right Circular Cone



A= π (R_1+R_2)s

V= $\frac{\pi h}{3}$(R^2+Rr+r^2)

3.34. Sphere

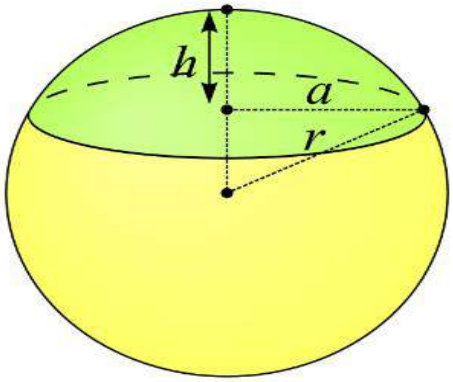


Surface Area of a Sphere=$4\pi r^2$

Volume of a sphere= $\frac{4}{3}\pi^3$

Where, r is the radius of the sphere

3.35. Spherical Cap



The volume of the spherical cap with base radius, $V = \frac{\pi}{3}H^2(3R^2 = H^2)$

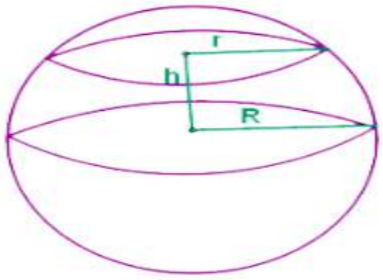
Where,
H = height
S = sphere radius
A = base radius
R = sphere radius

3.36. Spherical Sector

Surface Area of the spherical sector, $A=\pi r\ (2h+a)$

Volume of the Spherical Sector, $V = \frac{2\pi r^2 h}{3}$

3.37. Spherical Segment



Surface Area of the spherical segment, A =2πRh

Volume of the Spherical segment, V = $\frac{\pi h}{6}(3r_1^2 + 3r_2^2 + h^2)$

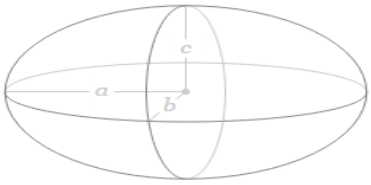
3.38. Spherical Wedge

Surface Area=$2R^2\theta$

Volume=$\frac{2}{3}R^3\,\theta$

Arc Length at the equator = Rθ

3.39. Ellipsoid



Volume of an Ellipsoid, V=$\frac{4}{3}$ πabc (or)

V=$\frac{4}{3}$ $\pi r_1\, r_2\, r_3$

Where,

r1= radius of the ellipsoid 1

r2= radius of the ellipsoid 2

r3= radius of the ellipsoid 3