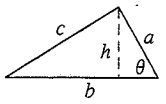
FORMULAS FROM GEOMETRY

Triangle

$h = a \sin \theta$

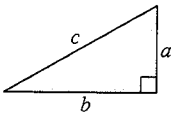
Area $= \frac{1}{2}bh$

(Law of Cosines)
$c^2 = a^2 + b^2 - 2ab \cos \theta$



Right Triangle

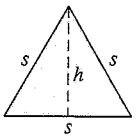
(Pythagorean Theorem)
$c^2 = a^2 + b^2$



Equilateral Triangle

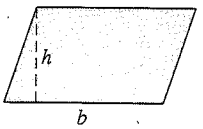
$h = \frac{\sqrt{3}s}{2}$

Area $= \frac{\sqrt{3}s^2}{4}$



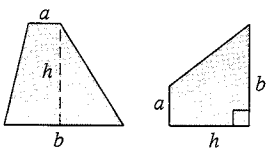
Parallelogram

Area $= bh$



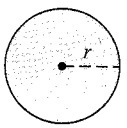
Trapezoid

Area $= \frac{h}{2}(a + b)$



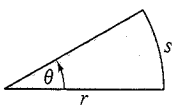
Circle

Area $= \pi r^2$
Circumference $= 2\pi r$



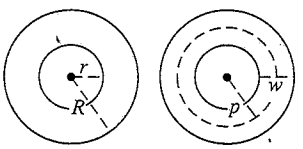
Sector of Circle

(θ in radians)
Area $= \frac{\theta r^2}{2}$
$s = r\theta$



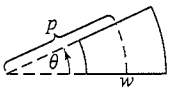
Circular Ring

(p = average radius,
w = width of ring)
Area $= \pi(R^2 - r^2)$
$= 2\pi pw$



Sector of Circular Ring

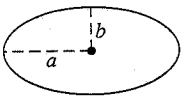
(p = average radius,
w = width of ring,
θ in radians)
Area $= \theta pw$



Ellipse

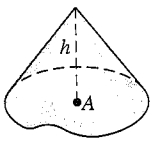
Area $= \pi ab$

Circumference $\approx 2\pi\sqrt{\frac{a^2 + b^2}{2}}$



Cone

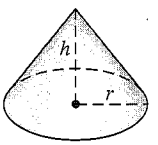
(A = area of base)
Volume $= \frac{Ah}{3}$



Right Circular Cone

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

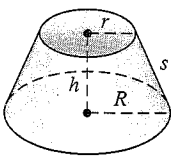
Lateral Surface Area $= \pi r\sqrt{r^2 + h^2}$



Frustum of Right Circular Cone

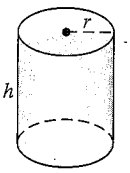
Volume $= \frac{\pi(r^2 + rR + R^2)h}{3}$

Lateral Surface Area $= \pi s(R + r)$



Right Circular Cylinder

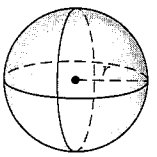
Volume $= \pi r^2 h$
Lateral Surface Area $= 2\pi rh$



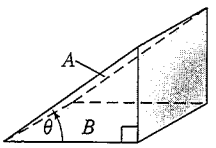
Sphere

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

Surface Area $= 4\pi r^2$



Wedge

(A = area of upper face,
B = area of base)

$A = B \sec \theta$