Notes & Formulas for Volume & Area of Solids

Solid Shape	Volume	Lateral Area	*Total Area	Rules
Sphere	$\frac{4\pi r^3}{3}$	$4\pi r^2$	$4\pi r^2$	None
Pyramid or Cone	$\frac{A_b \cdot h}{3}$	$\frac{P_b \cdot h_s}{2}$	$\frac{P_b \cdot h_s}{2} + A_b$	For right & **regular only
Prism or Cylinder	$A_b \cdot h$	$P_b \cdot h$	$P_b \cdot h + 2A_b$	For right only

* also known as surface area

**equal length base edges

a = apothem
A_b = Area of the base
b = base
B = biggest base
d = shortest diagonal
D = longest diagonal
h = height
h_s = slant height
l = length
P_b = perimeter of base
r = radius
s = side
w = width
π = Pi (approximately 3.14)

Shape	P_b	A_b
Circle	$2\pi r$ or πd	πr^2
Triangle	$s_1 + s_2 + s_3$	$\frac{b \cdot h}{2}$
Square	4s	s^2
Rectangle	2(l + w)	$l \cdot w$
Parallelogram	2(b + s)	$b \cdot h$
Rhombus	4s	$\frac{D \cdot d}{2}$
Trapezoid	B + b + 2s	$\frac{(B + b) \cdot h}{2}$
???agon	s(# of sides)	$\frac{Pb \cdot a}{2}$

Circumference (perimeter) of a circle:

$2\pi r$ or πd where d = diameter

Finding lateral and total area of irregular pyramids.

- Find the slant height of each triangle that makes up the sides of the pyramid. The slant height can then be used as the height of each triangle for calculating the area. This may involve the use of the *Pythagorean Theory* ($a^2 + b^2 = c^2$ where a & b represent the shorter sides (legs) of a right triangle and c the hypotenuse or longest side of a right triangle (the side across from the right angle)).

- Lateral area in this case would be the sum of the areas of all the triangles involved, and total area would be the lateral area plus the area of the base.