PERIMETER – AREA – VOLUME

DEFINITIONS:

Perimeter
Distance around the outside edge of a figure.
Perimeter has **1** dimension so units need no exponent.

Area
Number of square units in a flat surface.
(i.e. 1 inch^2 = 1 inch by 1 inch)
Area has **2** dimensions so units are squared.

Volume
Number of cubic units in a solid figure.
(i.e. 1 inch^3 = 1 inch by 1 inch by 1 inch)
Volume = (Area of the Base)(Height of the Solid)
Volume has **3** dimensions so units are cubed.

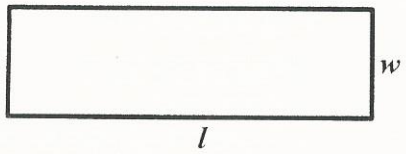
Surface Area
The sum of the areas of all the outside surfaces of a solid figure
SA = (Base Figure's Perimeter)(Height of the Solid) +2(Area of the Base)

Lateral Surface Area
The surface area on the sides of a solid figure (excludes the top and bottom surface area)
LSA = (Base Figure's Perimeter)(Height of the Solid)

CALCULATIONS:

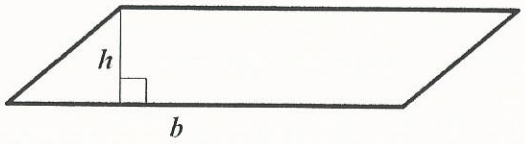
Rectangle or Square

$Area = length \times width = l \times w$



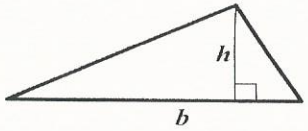
Parallelogram

$Area = base \times height = b \times h$



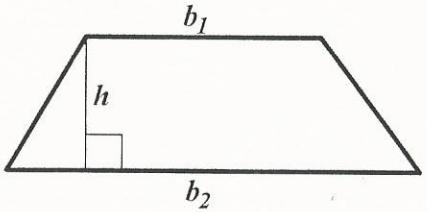
Triangle

$Area = \frac{1}{2} \times base \times height = \frac{1}{2} \times b \times h$



Trapezoid

$$Area = \frac{1}{2}(sum\ of\ the\ bases) \times height = \frac{1}{2}(b_1 + b_2) \times h$$

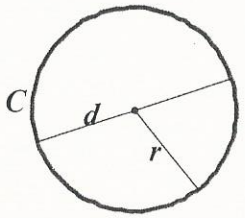


Circle

$Circumference = 2\pi(radius)$ or $\pi(diameter)$

$C = 2\pi \cdot r$ or $\pi \cdot d$

$Area = \pi(radius)^2 = \pi \cdot r^2$

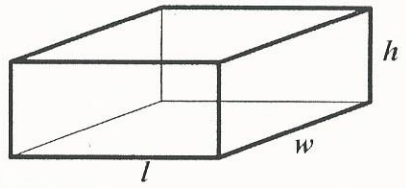


PERIMETER – AREA – VOLUME (CONT.)

MORE CALCULATIONS:

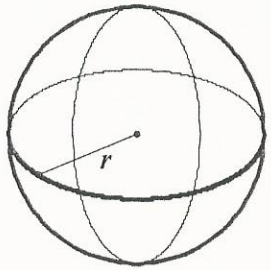
Rectangular Prism or Cube

$$Volume = length \times width \times height$$
$$= l \times w \times h$$
$$SurfaceArea = 2w \cdot l + 2l \cdot h + 2w \cdot h$$



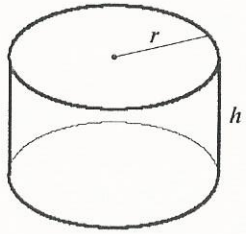
Sphere

$$Volume = \frac{4}{3}\pi(radius)^3 = \frac{4}{3}\pi \cdot r^3$$
$$SurfaceArea = 4\pi(radius)^2 = 4\pi \cdot r^2$$



Right Cylinder

$$Volume = \pi(radius)^2\, height = \pi \cdot r^2 h$$
$$SurfaceArea = 2\pi(radius)^2 + 2\pi(radius)(height)$$
$$= 2\pi \cdot r^2 + 2\pi \cdot r \cdot h$$



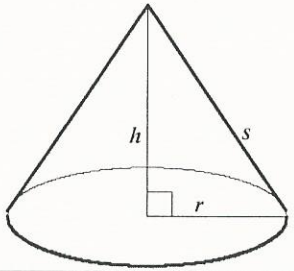
Cone

$$Volume = \frac{1}{3}\pi(radius)^2(height) = \frac{1}{3}\pi \cdot r^2 \cdot h$$

$$Surface\ Area = \pi(radius)^2 + \pi(radius)(slant\ height)$$
$$= \pi \cdot r^2 + \pi \cdot r \cdot s$$

When s is unknown it can be calculated by

$$s = \sqrt{(radius)^2 + (height)^2} = \sqrt{r^2 + h^2}$$



Pyramid

$$Volume = \frac{1}{3}(base\ area)(height) = \frac{1}{3}(base\ area) \cdot h$$

$$Surface\ Area = (base\ area) + \frac{1}{2}(slant\ height)(base\ perimeter)$$
$$= (base\ area) + \frac{1}{2} \cdot l \cdot (base\ perimeter)$$