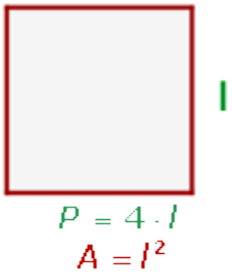
Universidad Tecnológica de Pereira

Taller 1

Expresiones

1. Calcular en Dr Racket el área y perímetro las siguientes figuras

1.1 Cuadrado



(display "El Perimetro de un cuadrado")

(define l 5)

(display " de lado: ")

(display l)

(display " es: ")

(+ l l l l)

(display "El Area de un cuadrado")

(display " de lado: ")

(display l)

(display " es: ")

(* l l)

Figuras geométricas

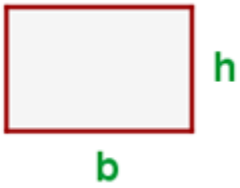
Figuras geométricas planas

Cuadrado

$$P = 4 \cdot l$$

$$A = l^2$$

Rectángulo

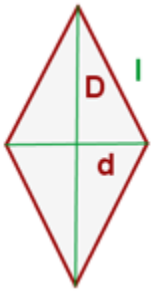


$$d = \sqrt{b^2 + h^2}$$

$$P = 2 \cdot (b + h)$$

$$A = b \cdot h$$

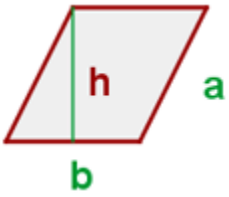
Rombo



$$P = 4 \cdot l$$

$$A = \frac{D \cdot d}{2}$$

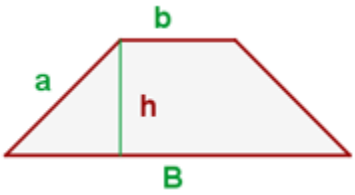
Romboide



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

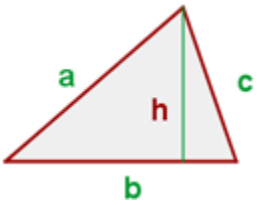
$A = b \cdot h$

Trapecio



$$A = \frac{(B + b) \cdot h}{2}$$

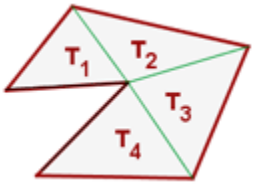
Triángulo



$$P = a + b + c$$

$$A = \frac{b \cdot h}{2}$$

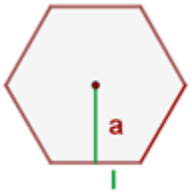
Polígono



El área se obtiene triangulando el polígono y sumando el área de dichos triángulos.

$$A = T_1 + T_2 + T_3 + T_4$$

Polígono regular



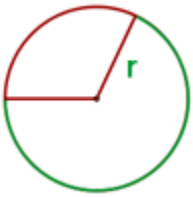
$$P = 6 \cdot l$$

$$A = \frac{\text{perímetro} \cdot \text{apotema}}{2}$$

Circunferencia

$$L = 2 \cdot \pi \cdot r$$

Arco de circunferencia

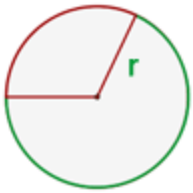


$$L = \frac{2 \cdot \pi \cdot r \cdot \alpha}{360^\circ}$$

Círculo

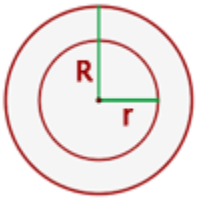
$$A = \pi \cdot r^2$$

Sector circular



$$A = \frac{\pi \cdot r^2 \cdot \alpha}{360^\circ}$$

Corona circular

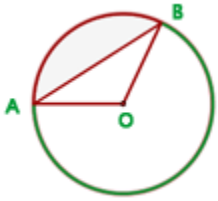


$$A = \pi \cdot \left(R^2 - r^2\right)$$

Trapecio circular

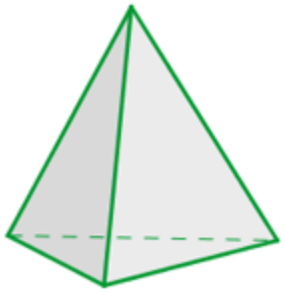
$$A = \frac{\pi \cdot \left(R^2 - r^2\right) \cdot \alpha}{360^\circ}$$

Segmento circular



Cuerpos geométricos

Tetraedro



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

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

Octaedro

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

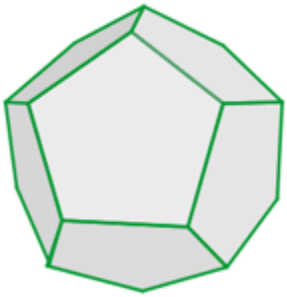
$$V = \frac{\sqrt{2}}{3} a^3$$

Icosaedro

$$A = 5 \cdot \sqrt{3} \cdot a^2$$

$$V = \frac{5}{12}\left(3 + \sqrt{5}\right) a^3$$

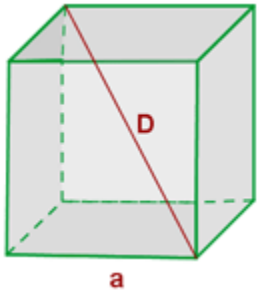
Dodecaedro



$$A = 30 \cdot a \cdot ap$$

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

Cubo



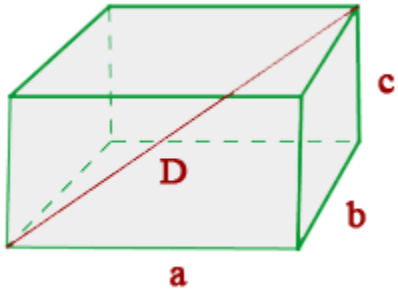
$$D = \sqrt{3} \cdot a$$

$$A_L = 4 \cdot a^2$$

$$A_T = 6 \cdot a^2$$

$$V = a^3$$

Ortoedro

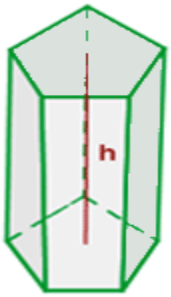


$$D = \sqrt{a^2 + b^2 + c^2}$$

$$A = 2(a \cdot b + a \cdot c + b \cdot c)$$

$$V = a \cdot b \cdot c$$

Prisma



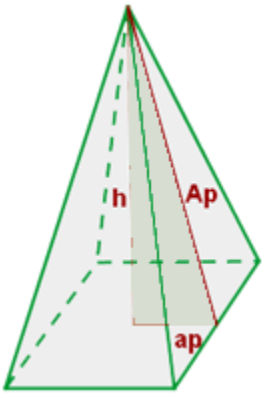
P_B = Perímetro de la base

$A_L = P_B \cdot h$

$A_T = A_L + 2 \cdot A_B$

$V = A_B \cdot h$

Pirámide



P_B = Perímetro de la base

Ap = apotema de la pirámide

ap = apotema de la base

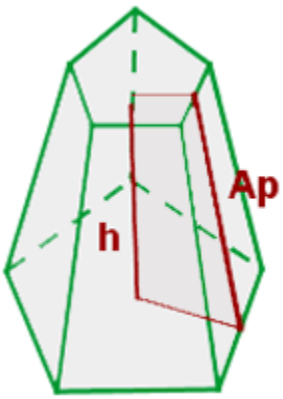
$$Ap^2 = h^2 + ap^2$$

$$A_L = \frac{P_B \cdot Ap}{2}$$

$$A_T = A_L + A_B$$

$$V = \frac{A_B \cdot h}{3}$$

Tronco de pirámide



P = Perímetro de la base mayor

P' = Perímetro de la base menor

Ap = apotema del tronco de pirámide

A = Área de la base mayor

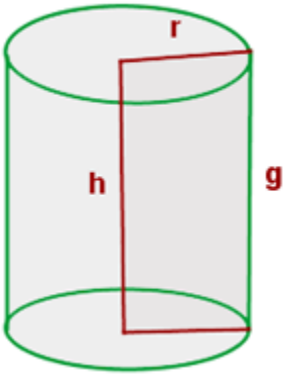
A' = Área de la base menor

$$A_L = \frac{P + P'}{2} \cdot Ap$$

$$A_T = \frac{P + P'}{2} \cdot Ap + A + A'$$

$$V = \frac{h}{3} \cdot \left(A + A' + \sqrt{A \cdot A'}\right)$$

Cilindro



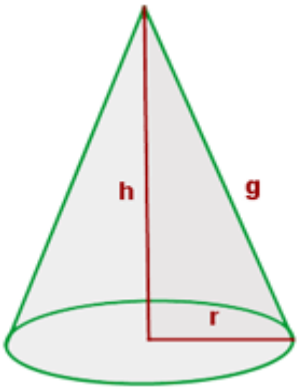
$$g = h$$

$$A_L = 2 \cdot \pi \cdot r \cdot h$$

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

$$V = \pi \cdot r^2 \cdot h$$

Cono



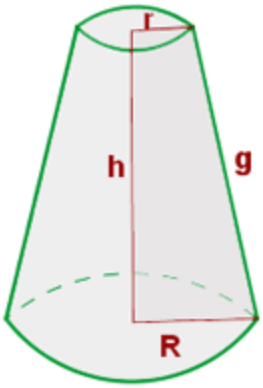
$$g^2 = r^2 + h^2$$

$$A_L = \pi \cdot r \cdot g$$

$$A_T = \pi \cdot r \cdot (g + r)$$

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

Tronco de cono

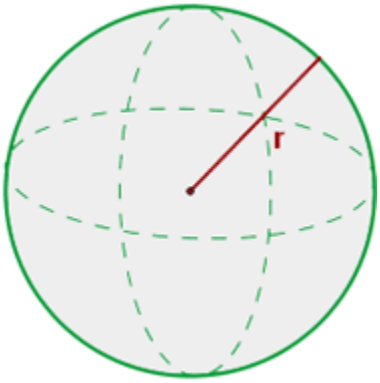


$$A_L = \pi \cdot (R + r) \cdot g$$

$$A_T = \pi \left[g(R + r) + R^2 + r^2 \right]$$

$$V = \frac{1}{3} \cdot \pi \cdot h \left(R^2 + r^2 + R \cdot r \right)$$

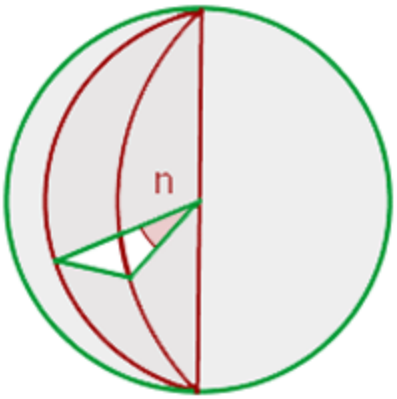
Esfera



$$A = 4 \cdot \pi \cdot r^2$$

$$V = \frac{4}{3} \pi \cdot r^3$$

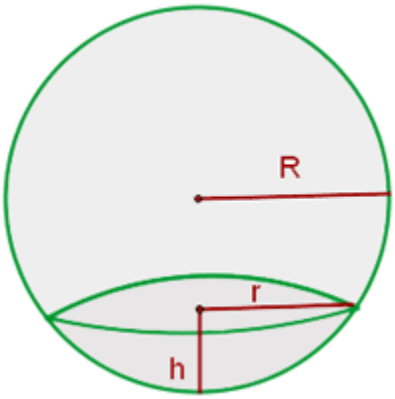
Huso y cuña esférica



$$A = \frac{4 \cdot \pi \cdot r^2}{360} \cdot n$$

$$V = \frac{4}{3} \cdot \frac{\pi \cdot r^3}{360} \cdot n$$

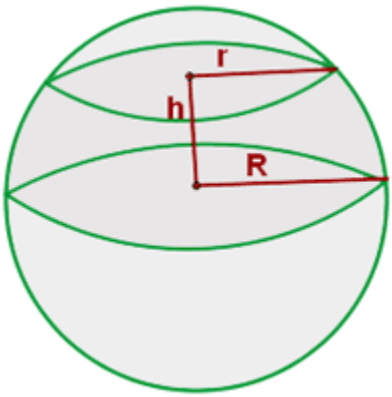
Casquete esférico



$$A = 2 \cdot \pi \cdot R \cdot h$$

$$V = \frac{1}{3} \pi \cdot h^2 \cdot (3R - h)$$

Zona esférica



$$A = 2 \cdot \pi \cdot R \cdot h$$

$$V = \frac{1}{6} \pi \cdot h \cdot \left(h^2 + 3 \cdot R^2 + 3r^2 \right)$$