

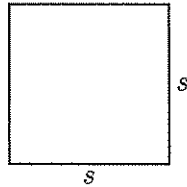
2D GEOMETRY FORMULAS

SQUARE

s = side

Area: $A = s^2$

Perimeter: $P = 4s$

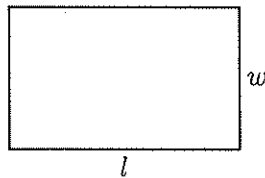


RECTANGLE

l = length, w = width

Area: $A = lw$

Perimeter: $P = 2l + 2w$

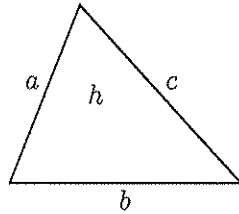


TRIANGLE

b = base, h = height

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

Perimeter: $P = a + b + c$

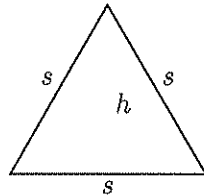


EQUILATERAL TRIANGLE

s = side

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

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

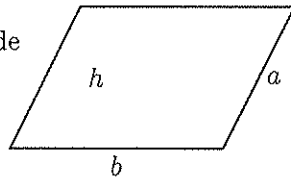


PARALLELOGRAM

b = base, h = height, a = side

Area: $A = bh$

Perimeter: $P = 2a + 2b$



TRAPEZOID

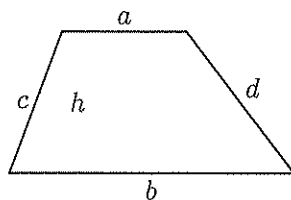
a, b = bases; h = height;

c, d = sides

Area: $A = \frac{1}{2}(a + b)h$

Perimeter:

$P = a + b + c + d$



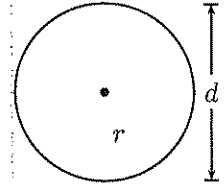
CIRCLE

r = radius, d = diameter

Diameter: $d = 2r$

Area: $A = \pi r^2$

Circumference: $C = 2\pi r = \pi d$

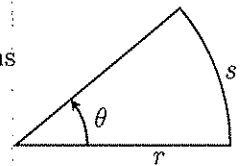


SECTOR OF CIRCLE

r = radius, θ = angle in radians

Area: $A = \frac{1}{2}\theta r^2$

Arc Length: $s = \theta r$



ELLIPSE

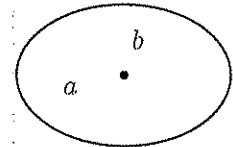
a = semimajor axis

b = semiminor axis

Area: $A = \pi ab$

Circumference:

$C \approx \pi \left(3(a + b) - \sqrt{(a + 3b)(b + 3a)} \right)$



ANNULUS

r = inner radius,

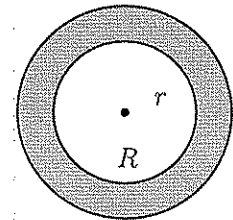
R = outer radius

Average Radius: $\rho = \frac{1}{2}(r + R)$

Width: $w = R - r$

Area: $A = \pi(R^2 - r^2)$

or $A = 2\pi\rho w$



REGULAR POLYGON

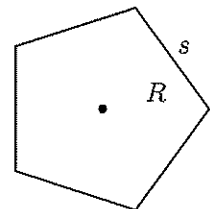
s = side length,

n = number of sides

Circumradius: $R = \frac{1}{2}s \csc\left(\frac{\pi}{n}\right)$

Area: $A = \frac{1}{4}ns^2 \cot\left(\frac{\pi}{n}\right)$

or $A = \frac{1}{2}nR^2 \sin\left(\frac{2\pi}{n}\right)$



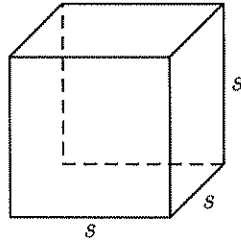
3D GEOMETRY FORMULAS

CUBE

s = side

Volume: $V = s^3$

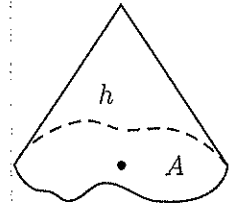
Surface Area: $S = 6s^2$



GENERAL CONE OR PYRAMID

A = area of base, h = height

Volume: $V = \frac{1}{3}Ah$



RECTANGULAR SOLID

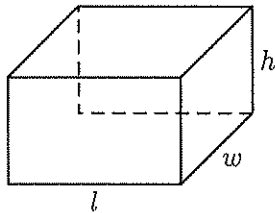
l = length, w = width,

h = height

Volume: $V = lwh$

Surface Area:

$S = 2lw + 2lh + 2wh$



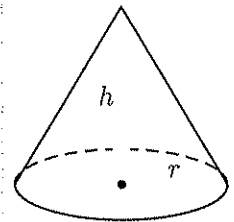
RIGHT CIRCULAR CONE

r = radius, h = height

Volume: $V = \frac{1}{3}\pi r^2 h$

Surface Area:

$S = \pi r\sqrt{r^2 + h^2} + \pi r^2$

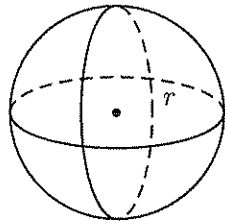


SPHERE

r = radius

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

Surface Area: $S = 4\pi r^2$



FRUSTUM OF A CONE

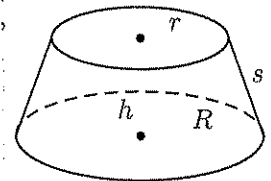
r = top radius, R = base radius,

h = height, s = slant height

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

Surface Area:

$S = \pi s(R + r) + \pi r^2 + \pi R^2$

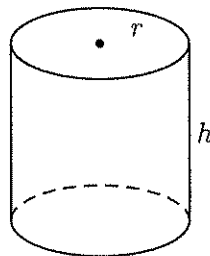


RIGHT CIRCULAR CYLINDER

r = radius, h = height

Volume: $V = \pi r^2 h$

Surface Area: $S = 2\pi r h + 2\pi r^2$



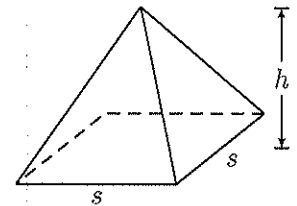
SQUARE PYRAMID

s = side, h = height

Volume: $V = \frac{1}{3}s^2 h$

Surface Area:

$S = s(s + \sqrt{s^2 + 4h^2})$



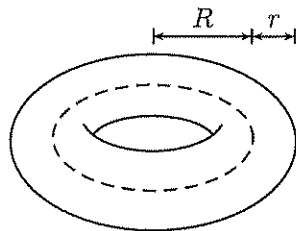
TORUS

r = tube radius,

R = torus radius

Volume: $V = 2\pi^2 r^2 R$

Surface Area: $S = 4\pi^2 r R$



REGULAR TETRAHEDRON

s = side

Volume: $V = \frac{1}{12}\sqrt{2}s^3$

Surface Area: $S = \sqrt{3}s^2$

