Geometry formulas

coddy.tech/math/formulas/geometry

AREA AND PERIMETER

Square

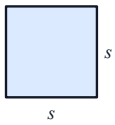
AREA

$A = s^2$

PERIMETER

$P = 4s$

s side



Rectangle

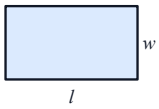
AREA

$A = lw$

PERIMETER

$P = 2l + 2w$

l length w width



Triangle

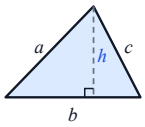
AREA

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

PERIMETER

$P = a + b + c$

b base h height
a, b, c sides



Parallelogram

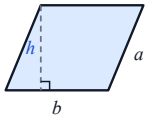
AREA

$A = bh$

PERIMETER

$P = 2a + 2b$

b base h height a side

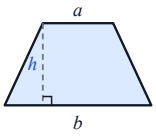


Trapezoid

AREA

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

a, b parallel sides h height



Rhombus

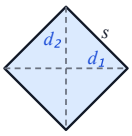
AREA

$A = \frac{1}{2}d_1d_2$

PERIMETER

$P = 4s$

d_1, d_2 diagonals s side



Regular polygon

AREA

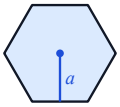
$A = \frac{1}{2}aP$

SUM OF INTERIOR ANGLES

$S = (n - 2) \cdot 180°$

EACH INTERIOR ANGLE

$\frac{(n - 2) \cdot 180°}{n}$



a apothem P perimeter n number of sides

CIRCLES

Circle

CIRCUMFERENCE

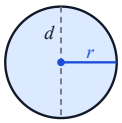
$C = 2\pi r = \pi d$

AREA

$A = \pi r^2$

$d = 2r$

r radius d diameter



Arc and sector

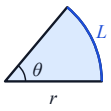
ARC LENGTH

$L = \frac{\theta}{360°} \cdot 2\pi r$

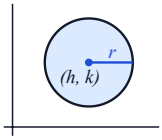
SECTOR AREA

$A = \frac{\theta}{360°} \cdot \pi r^2$

θ central angle r radius



Equation of a circle



$(x - h)^2 + (y - k)^2 = r^2$

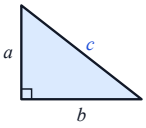
(h, k) center r radius

TRIANGLES

Pythagorean theorem

$a^2 + b^2 = c^2$

a, b legs c hypotenuse



Angles

ANGLES OF A TRIANGLE

$\alpha + \beta + \gamma = 180°$

COMPLEMENTARY ANGLES

$\alpha + \beta = 90°$

SUPPLEMENTARY ANGLES

$\alpha + \beta = 180°$

Special right triangles

30-60-90 SIDES

$x : x\sqrt{3} : 2x$

45-45-90 SIDES

$x : x : x\sqrt{2}$

Equilateral triangle

AREA

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

HEIGHT

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

s side

Heron's formula

AREA

$A = \sqrt{s(s - a)(s - b)(s - c)}$

$s = \frac{a + b + c}{2}$

a, b, c sides s half the perimeter

VOLUME AND SURFACE AREA

Cube

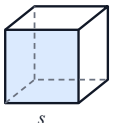
VOLUME

$V = s^3$

SURFACE AREA

$SA = 6s^2$

s side



Rectangular prism

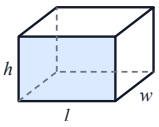
VOLUME

$V = lwh$

SURFACE AREA

$SA = 2(lw + lh + wh)$

l length w width h height



Prism

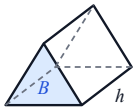
VOLUME

$V = Bh$

SURFACE AREA

$SA = 2B + Ph$

B area of the base
P perimeter of the base
h height



Cylinder

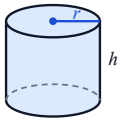
VOLUME

$V = \pi r^2 h$

SURFACE AREA

$SA = 2\pi r^2 + 2\pi rh$

r radius h height



Cone

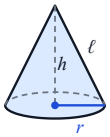
VOLUME

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

SURFACE AREA

$SA = \pi r^2 + \pi r\ell$

$\ell = \sqrt{r^2 + h^2}$



r radius h height
ℓ slant height

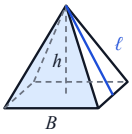
Pyramid

VOLUME

$V = \frac{1}{3}Bh$

SURFACE AREA

$SA = B + \frac{1}{2}P\ell$



B area of the base
P perimeter of the base
h height ℓ slant height

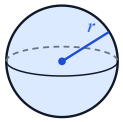
Sphere

VOLUME

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

SURFACE AREA

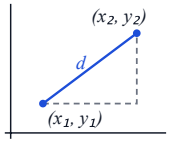
$SA = 4\pi r^2$



r radius

COORDINATE GEOMETRY

Distance formula



$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

(x_1, y_1), (x_2, y_2) the two points

Midpoint formula

$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

(x_1, y_1), (x_2, y_2) the two points

Slope

$m = \frac{y_2 - y_1}{x_2 - x_1}$

PARALLEL LINES

$m_1 = m_2$

PERPENDICULAR LINES

$m_1 \cdot m_2 = -1$

m slope

Equation of a line

SLOPE-INTERCEPT FORM

$y = mx + b$

POINT-SLOPE FORM

$y - y_1 = m(x - x_1)$

m slope b y-intercept