

Area and perimeter

Square	$A = s^2, \quad P = 4s$
Rectangle	$A = lw, \quad P = 2(l + w)$
Triangle	$A = \frac{1}{2}bh = \frac{1}{2}ab \sin C$
Heron's formula	$A = \sqrt{s(s-a)(s-b)(s-c)}, \quad s = \frac{a+b+c}{2}$
Equilateral triangle	$A = \frac{\sqrt{3}}{4}s^2$
Parallelogram	$A = bh$
Trapezoid	$A = \frac{1}{2}(a + b)h$
Rhombus, kite	$A = \frac{1}{2}d_1d_2$
Circle	$A = \pi r^2, \quad C = 2\pi r = \pi d$
Sector (θ in rad)	$A = \frac{1}{2}r^2\theta, \quad s = r\theta$
Ellipse	$A = \pi ab$
Regular polygon	$A = \frac{1}{2} \times \text{perimeter} \times \text{apothem}$

Volume and surface area

Cube	$V = a^3, \quad SA = 6a^2$
Rectangular prism	$V = lwh, \quad SA = 2(lw + lh + wh)$
Any prism	$V = (\text{base area}) \times h$
Cylinder	$V = \pi r^2 h, \quad SA = 2\pi r^2 + 2\pi rh$
Cone	$V = \frac{1}{3}\pi r^2 h, \quad SA = \pi r^2 + \pi rl, \quad l = \sqrt{r^2 + h^2}$
Pyramid	$V = \frac{1}{3}(\text{base area}) \times h$
Sphere	$V = \frac{4}{3}\pi r^3, \quad SA = 4\pi r^2$
Hemisphere	$V = \frac{2}{3}\pi r^3, \quad SA = 3\pi r^2$

Right triangles

Pythagorean theorem	$a^2 + b^2 = c^2$
45-45-90	$1 : 1 : \sqrt{2}$
30-60-90	$1 : \sqrt{3} : 2$
Common triples	3, 4, 5 5, 12, 13 8, 15, 17 7, 24, 25

Angles

Triangle	$A + B + C = 180^\circ$
Polygon (n sides)	interior sum = $(n - 2) \times 180^\circ$
Complementary, supplementary	$90^\circ, \quad 180^\circ$

Coordinate geometry

Distance	$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Midpoint	$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$
Slope	$m = \frac{y_2 - y_1}{x_2 - x_1}$
Line	$y - y_1 = m(x - x_1), \quad y = mx + b$
Circle	$(x - h)^2 + (y - k)^2 = r^2$