

CLASS 10

MATHS

FORMULAS HANDBOOK

Class 10 Maths Formulas Handbook (Chapter-wise)

Every key formula and result from the Class 10 Maths NCERT syllabus, organised by chapter, in one place -- covering all 12 chapters of the current 2026-27 CBSE syllabus, each cross-linked to our full Chapter-wise Solutions.

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How to Use This Handbook

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Chapter 1: Real Numbers

Euclid's Division Lemma: $a = bq + r$, where $0 \leq r < b$

HCF $\times$ LCM = Product of the two numbers (for exactly two numbers)

Fundamental Theorem of Arithmetic: every composite number has a unique prime factorisation (order aside)

Proof-of-irrationality method: assume rational (p/q , coprime, $q \neq 0$) $\rightarrow$ derive a common factor in p and $q \rightarrow$ contradiction

See full [Chapter 1 Solutions](#)

Chapter 2: Polynomials

Quadratic polynomial: $p(x) = ax^2 + bx + c$ ($a \neq 0$); zeroes are the values of x where $p(x) = 0$

Sum of zeroes $\alpha + \beta = -b/a$ ($-(\text{coefficient of } x)/(\text{coefficient of } x^2)$)

Product of zeroes $\alpha\beta = c/a$ (constant term/coefficient of x^2)

Forming a quadratic from sum/product: $x^2 - (\text{sum})x + (\text{product}) = 0$

See full [Chapter 2 Solutions](#)

Chapter 3: Pair of Linear Equations in Two Variables

General form: $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$

Intersecting (unique solution): $a_1/a_2 \neq b_1/b_2$

Parallel (no solution, inconsistent): $a_1/a_2 = b_1/b_2 \neq c_1/c_2$

Coincident (infinite solutions): $a_1/a_2 = b_1/b_2 = c_1/c_2$

Methods: substitution, elimination; reciprocal substitution ($u = 1/(x-y)$, $v = 1/(x+y)$) for speed/time word problems

Chapter 4: Quadratic Equations

Standard form: $ax^2 + bx + c = 0$ ($a \neq 0$)

Quadratic formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Discriminant $D = b^2 - 4ac$: $D > 0$ distinct real roots, $D = 0$ equal real roots, $D < 0$ no real roots

Sum of roots = $-b/a$, **Product of roots** = c/a

Factorisation: split the middle term bx into two terms whose product = $a \times c \times x^2$ and sum = bx

Chapter 5: Arithmetic Progressions

nth term: $a_n = a + (n-1)d$

Sum (a,d known): $S_n = (n/2)[2a + (n-1)d]$ | **Sum (a,l known):** $S_n = (n/2)(a+l)$

See full [Chapter 5 Solutions](#)

Chapter 6: Triangles

BPT: if $DE \parallel BC$ in $\triangle ABC$ (D on AB, E on AC), then $AD/DB = AE/EC$

Similarity criteria: AA(AAA), SSS, SAS

Ratio of areas of similar triangles = (ratio of corresponding sides)²

Pythagoras theorem (via similarity): in right $\triangle ABC$ right-angled at B, $AB^2 + BC^2 = AC^2$

See full [Chapter 6 Solutions](#)

Chapter 7: Coordinate Geometry

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

Distance from origin: $\sqrt{x^2 + y^2}$

Section formula (ratio m:n): $\left(\frac{mx_2 + nx_1}{m+n}, \frac{my_2 + ny_1}{m+n}\right)$

Midpoint formula: $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

Area of a triangle: $\frac{1}{2}|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$ — also the collinearity test (area=0)

See full [Chapter 7 Solutions](#)

Chapter 8: Introduction to Trigonometry

$\sin \theta = \text{opp/hyp}$, $\cos \theta = \text{adj/hyp}$, $\tan \theta = \sin \theta / \cos \theta$; cosec, sec, cot are reciprocals.

$\sin^2 \theta + \cos^2 \theta = 1$; $1 + \tan^2 \theta = \sec^2 \theta$; $1 + \cot^2 \theta = \text{cosec}^2 \theta$.

Complementary: $\sin(90^\circ - \theta) = \cos\theta$, $\tan(90^\circ - \theta) = \cot\theta$, $\sec(90^\circ - \theta) = \operatorname{cosec}\theta$.

Standard values at $0^\circ, 30^\circ, 45^\circ, 60^\circ, 90^\circ$ — see full [revision notes](#).

Chapter 9: Some Applications of Trigonometry

height = distance $\times$ $\tan(\theta)$; distance = height / $\tan(\theta)$

line-of-sight length = height / $\sin(\theta)$ = distance / $\cos(\theta)$

Complementary angles from distances p, q: height = $\sqrt{pq}$

Moving-observer formula: height = $a \cdot \tan(\theta) \cdot \tan(\phi) / (\tan(\phi) - \tan(\theta))$

Chapter 10: Circles

Tangent is perpendicular to the radius at the point of contact

Lengths of tangents from an external point to a circle are equal

Tangent length = $\sqrt{d^2 - r^2}$ for a point at distance d from centre, circle radius r

Parallelogram circumscribing a circle is a rhombus

Chapter 11: Areas Related to Circles

Circumference = $2\pi r$; Area of circle = πr^2

Arc length = $(\theta/360) \times 2\pi r$

Area of sector = $(\theta/360) \times \pi r^2 = (1/2) \times l \times r$

Area of segment = Area of sector – $(1/2)r^2\sin\theta$

Area of ring = $\pi(R^2 - r^2)$

[Full Chapter 11 Solutions →](#)

Chapter 12: Surface Areas and Volumes

Cube: TSA = $6a^2$, Volume = a^3

Cuboid: TSA = $2(lb+bh+hl)$, Volume = lbh

Cylinder: CSA = $2\pi rh$, TSA = $2\pi r(r+h)$, Volume = πr^2h

Cone: CSA = πrl , TSA = $\pi r(l+r)$, Volume = $(1/3)\pi r^2h$; slant height $l = \sqrt{r^2+h^2}$

Sphere: $SA = 4\pi r^2$, Volume = $(4/3)\pi r^3$

Hemisphere: $CSA = 2\pi r^2$, $TSA = 3\pi r^2$, Volume = $(2/3)\pi r^3$

Combination solids: add curved/visible surfaces only for area; add (or subtract, for cavities) volumes directly.

Chapter 13: Statistics

Mean (Direct): $\bar{x} = \Sigma f_i x_i / \Sigma f_i$

Mean (Assumed Mean): $\bar{x} = a + \Sigma f_i d_i / \Sigma f_i$

Mean (Step-Deviation): $\bar{x} = a + (\Sigma f_i u_i / \Sigma f_i) \times h$

Mode = $l + [(f_1 - f_0) / (2f_1 - f_0 - f_2)] \times h$

Median = $l + [(n/2 - cf) / f] \times h$

Empirical relationship: Mode = 3 Median – 2 Mean

[Full Chapter 13 Solutions →](#)

Chapter 14: Probability

$P(E)$ = favourable outcomes / total outcomes

$0 \leq P(E) \leq 1$; $P(E) + P(\text{not } E) = 1$

Two dice together: 36 outcomes; deck of cards: 52 (12 face cards)

[Full Chapter 14 Solutions →](#)

How to Use This Handbook

Formulas alone won't get you full marks — CBSE examiners award marks for showing correct working, not just stating a result. Use this page as a quick lookup while solving problems in our chapter-wise Solutions and Extra Questions, not as a replacement for practicing the full method.