

CBSE Class 10 Maths Formula Sheet: all 14 chapters (2026-27 syllabus)

Every formula the board paper can ask for, chapter by chapter, in the NCERT order. The ones in bold chapters (polynomials, quadratics, APs, trigonometry, mensuration, statistics) carry the 5-mark questions.

1. Real Numbers

- $HCF(a, b) \times LCM(a, b) = a \times b$ (for two numbers)
- Fundamental theorem of arithmetic: every composite number is a unique product of primes
- Proof by contradiction that $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$ are irrational: assume p/q in lowest terms, show p and q share a factor

2. Polynomials

- For $ax^2 + bx + c$ with zeros α , β : $\alpha + \beta = -b/a$, $\alpha\beta = c/a$
- Quadratic from zeros: $x^2 - (\alpha + \beta)x + \alpha\beta$
- For cubic $ax^3 + bx^2 + cx + d$: $\alpha + \beta + \gamma = -b/a$, $\alpha\beta + \beta\gamma + \gamma\alpha = c/a$, $\alpha\beta\gamma = -d/a$
- Degree of polynomial = number of zeros = number of times the graph meets the x-axis

3. Pair of Linear Equations

- $a_1x + b_1y + c_1 = 0$, $a_2x + b_2y + c_2 = 0$
- $a_1/a_2 \neq b_1/b_2 \rightarrow$ unique solution (lines cross)
- $a_1/a_2 = b_1/b_2 = c_1/c_2 \rightarrow$ infinitely many (same line)
- $a_1/a_2 = b_1/b_2 \neq c_1/c_2 \rightarrow$ no solution (parallel)
- Methods: substitution, elimination (cross-multiplication removed from the syllabus)

4. Quadratic Equations

- $ax^2 + bx + c = 0$, $a \neq 0$
- $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
- Discriminant $D = b^2 - 4ac$: $D > 0$ two real roots, $D = 0$ equal roots, $D < 0$ no real roots
- Sum of roots $-b/a$, product c/a

5. Arithmetic Progressions

- nth term: $a_n = a + (n - 1)d$
- Sum of n terms: $S_n = \frac{n}{2} [2a + (n - 1)d] = \frac{n}{2} (a + l)$
- $d = a_2 - a_1$; nth term from the end $= l - (n - 1)d$
- $a_n = S_n - S_{n-1}$

6. Triangles

- Basic Proportionality (Thales) theorem: DE parallel to BC gives $AD/DB = AE/EC$, and its converse
- Similarity: AA (AAA), SSS, SAS criteria
- Ratio of corresponding sides of similar triangles is equal (areas theorem removed from syllabus)

7. Coordinate Geometry

- Distance: $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- Section formula ($m:n$): $(\frac{mx_2 + nx_1}{m + n}, \frac{my_2 + ny_1}{m + n})$
- Midpoint: $(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$
- (Area of triangle formula removed from the syllabus)

8. Introduction to Trigonometry

- $\sin = P/H$, $\cos = B/H$, $\tan = P/B$, $\operatorname{cosec} = H/P$, $\sec = H/B$, $\cot = B/P$
- $\sin^2\theta + \cos^2\theta = 1$; $1 + \tan^2\theta = \sec^2\theta$; $1 + \cot^2\theta = \operatorname{cosec}^2\theta$
- Values: 0° , 30° , 45° , 60° , 90° (sin: 0, $1/2$, $1/\sqrt{2}$, $\sqrt{3}/2$, 1; cos reversed; tan: 0, $1/\sqrt{3}$, 1, $\sqrt{3}$, undefined)
- $\tan \theta = \sin \theta / \cos \theta$, $\cot \theta = \cos \theta / \sin \theta$

9. Applications of Trigonometry

- Angle of elevation (looking up) and depression (looking down); the depression from A equals the elevation from B (alternate angles)
- Draw the figure, mark the right angle, choose tan when the height and base are involved

10. Circles

- Tangent is perpendicular to the radius at the point of contact
- Tangents from an external point are equal in length

11. Areas Related to Circles

- Circumference $2\pi r$; area πr^2
- Arc length = $(\theta/360) \times 2\pi r$; sector area = $(\theta/360) \times \pi r^2$
- Segment area = sector area - triangle area
- Use $\pi = 22/7$ unless told otherwise

12. Surface Areas and Volumes

- Cuboid: TSA $2(lb + bh + hl)$, volume lbh ; cube: $6a^2$, a^3
- Cylinder: CSA $2\pi rh$, TSA $2\pi r(r + h)$, volume $\pi r^2 h$
- Cone: slant $l = \sqrt{r^2 + h^2}$, CSA πrl , TSA $\pi r(l + r)$, volume $(1/3)\pi r^2 h$
- Sphere: SA $4\pi r^2$, volume $(4/3)\pi r^3$; hemisphere: CSA $2\pi r^2$, TSA $3\pi r^2$, volume $(2/3)\pi r^3$
- Combinations: add the exposed surfaces, add the volumes

13. Statistics

- Mean (direct): $\Sigma fx / \Sigma f$; assumed mean: $a + \Sigma fd / \Sigma f$; step deviation: $a + (\Sigma fu / \Sigma f) \times h$
- Median = $l + [(n/2 - cf)/f] \times h$
- Mode = $l + [(f_1 - f_0)/(2f_1 - f_0 - f_2)] \times h$
- Empirical: $3 \text{ Median} = \text{Mode} + 2 \text{ Mean}$

14. Probability

- $P(E) = \text{favourable outcomes} / \text{total outcomes}$; $0 \leq P(E) \leq 1$; $P(E) + P(\text{not } E) = 1$
- Cards: 52 total, 4 suits of 13, 12 face cards, 26 red, 26 black; two dice: 36 outcomes

Where the 80 marks come from: algebra 20, geometry 15, trigonometry 12, statistics and probability 11, mensuration 10, number systems 6, coordinate geometry 6. Revise by marks, not by chapter count. 1-on-1 online tuition for Class 10 board maths: sciencewithshobha.com/subjects/cbse-class-9-10-maths/