

MATHEMATICS FORMULA BOOK

CLASS 7

Complete Formula & Concept Book (CBSE/NCERT)

Covers: Complete syllabus formulas

Use: Quick revision & exam preparation

Format: Chapter-wise formula reference

All formulas, identities, theorems & results in one place

1 Integers

Addition Properties

Closure, Commutative, Associative hold for Integers

Multiplication of Integers

$(+) \times (+) = +$, $(-) \times (-) = +$, $(+) \times (-) = -$

Division Rule

Same sign $\div$ same sign = +; different signs = -

Distributive Law

$a \times (b+c) = a \times b + a \times c$

2 Fractions and Decimals

Multiplication of Fractions

$(a/b) \times (c/d) = ac/bd$

Division of Fractions

$a/b \div c/d = a/b \times d/c$

Multiplication of Decimals

Multiply ignoring decimal, then place decimal (count total decimal places)

Division of Decimals

Convert divisor to whole number, adjust dividend accordingly

3 Data Handling

Mean

Mean = Sum of observations / Number of observations

Median

Middle value when data arranged in order

Mode

Value occurring most frequently

Probability

$P(E) = \text{Number of favourable outcomes} / \text{Total outcomes}$

4 Simple Equations

Linear Equation Solving

Perform same operation on both sides to isolate variable

Transposition

Moving a term changes its sign

5 Lines and Angles

Complementary Angles

Sum = 90°

Supplementary Angles

Sum = 180°

Linear Pair

Adjacent angles on a straight line sum to 180°

Vertically Opposite Angles

Equal in measure

Transversal — Corresponding Angles

Equal when lines are parallel

Transversal — Alternate Angles

Equal when lines are parallel

Co-interior (Allied) Angles

Sum = 180° when lines are parallel

6 The Triangle and Its Properties

Angle Sum Property

Sum of interior angles = 180°

Exterior Angle Property

Exterior angle = Sum of two interior opposite angles

Triangle Inequality

Sum of any two sides > third side

Pythagoras Theorem

(Hypotenuse)² = (Base)² + (Height)²

7 Congruence of Triangles

SSS Congruence

All 3 sides equal

SAS Congruence

2 sides & included angle equal

ASA Congruence

2 angles & included side equal

RHS Congruence

Right angle, hypotenuse & one side equal

8 Comparing Quantities

Percentage

Percentage = $(\text{Value/Total}) \times 100$

Profit

Profit = $SP - CP$ (when $SP > CP$)

Loss

Loss = $CP - SP$ (when $CP > SP$)

Profit %

$(\text{Profit}/CP) \times 100$

Loss %

$(\text{Loss}/CP) \times 100$

Simple Interest

$SI = (P \times R \times T) / 100$

Amount

$A = P + SI$

9 Rational Numbers

Rational Number

p/q where p, q are integers, $q \neq 0$

Standard Form

$$\text{HCF}(p,q) = 1 \text{ and } q > 0$$

Addition

$$a/b + c/d = (ad+bc)/bd$$

10 Practical Geometry

- Construction of triangle: SSS, SAS, ASA, RHS criteria
- Construction of a line parallel to a given line

11 Perimeter and Area

Shape	Perimeter	Area
Square	$4a$	a^2
Rectangle	$2(l+b)$	$l \times b$
Triangle	$a+b+c$	$\frac{1}{2} \times \text{base} \times \text{height}$
Parallelogram	$2(a+b)$	$\text{base} \times \text{height}$
Circle	$2\pi r$ (Circumference)	πr^2

12 Algebraic Expressions

Like Terms

Same variable & power — can be added/subtracted

Monomial, Binomial, Trinomial

1, 2, 3 terms respectively

Addition of Expressions

Add coefficients of like terms

13 Exponents and Powers

Product Law

$$a^m \times a^n = a^{m+n}$$

Quotient Law

$$a^m \div a^n = a^{m-n}$$

Power of a Power

$$(a^m)^n = a^{mn}$$

Power of Product

$$(ab)^m = a^m b^m$$

Power of Quotient

$$(a/b)^m = a^m/b^m$$

Zero Exponent

$$a^0 = 1 \text{ (} a \neq 0 \text{)}$$

Negative Exponent

$$a^{-n} = 1/a^n$$

14 Symmetry

Rotational Symmetry

Order = $360^\circ \div \text{angle of rotation}$

15 Visualising Solid Shapes

$F + V - E = 2$ (Faces + Vertices – Edges)