

Class 8 Maths: Quick Revision and Formula Sheet

Identities, mensuration and rules you need for Class 8, short and clear.

1. Rational numbers

- Closure: rational numbers are closed under addition, subtraction and multiplication. They are not closed under division by zero.
- Additive identity is 0; multiplicative identity is 1. Additive inverse of a/b is $-a/b$; multiplicative inverse (reciprocal) is b/a .

2. Linear equations in one variable

- Collect variable terms on one side, numbers on the other. Transposing: a term changes sign when it moves across the equals sign.
- For word problems: let the unknown be x , form the equation, solve, then check against the question.

3. Quadrilaterals

Sum of the interior angles of an n -sided polygon = $(n - 2) \times 180^\circ$

Sum of the exterior angles of any polygon = 360°

Shape	Key properties
Parallelogram	Opposite sides parallel and equal; opposite angles equal; diagonals bisect each other
Rectangle	Parallelogram with all angles 90° ; diagonals are equal
Rhombus	Parallelogram with all sides equal; diagonals bisect at 90°
Square	Rectangle and rhombus together
Kite	Two pairs of adjacent equal sides; one diagonal bisects the other at 90°

4. Data handling

- A **histogram** shows grouped data with bars touching. A **pie chart** shows parts of a whole as angles.
Probability = favourable $\div$ total. Chance of a head on a fair coin = $1/2$.

5. Squares, square roots, cubes, cube roots

- A perfect square ends in 0, 1, 4, 5, 6 or 9. It never ends in 2, 3, 7 or 8.
- Find a square root by prime factorisation (pair the primes) or long division.
 $(n + 1)^2 - n^2 = 2n + 1$ | Pythagorean triplet: $(2m, m^2 - 1, m^2 + 1)$
- Cube roots: group the prime factors in threes.

6. Comparing quantities

Discount = Marked price – Selling price | Discount % = Discount $\div$ MP $\times$ 100

Compound interest: $A = P \times (1 + R/100)^n$ CI = A – P

- For half-yearly compounding, use rate $R/2$ and $2n$ periods.

7. Algebraic expressions and identities

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(a - b)^2 = a^2 - 2ab + b^2$$

$$a^2 - b^2 = (a + b)(a - b)$$

$$(x + a)(x + b) = x^2 + (a + b)x + ab$$

- Multiply polynomials by multiplying each term with each term, then combine like terms.

8. Mensuration

Solid	Surface area	Volume
Cube (side a)	$6a^2$	a^3
Cuboid (l, b, h)	$2(lb + bh + hl)$	$l \times b \times h$
Cylinder (r, h)	Curved $2\pi rh$; total $2\pi r(r + h)$	$\pi r^2 h$

Trapezium area = $\frac{1}{2} \times (a + b) \times h$ | Rhombus area = $\frac{1}{2} \times d_1 \times d_2$ | Polygon: split into triangles

- $1 \text{ m}^3 = 1000 \text{ litres}$; $1 \text{ cm}^3 = 1 \text{ mL}$.

9. Exponents and powers

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

- Very small numbers: $0.00045 = 4.5 \times 10^{-4}$. Compare numbers in standard form by comparing the powers first.

10. Direct and inverse proportion

- Direct: both quantities rise or fall together, x/y is constant. Inverse: one rises as the other falls, $x \times y$ is constant.
- Example inverse: more workers, fewer days.

11. Factorisation

- Take out the common factor first. Then try an identity: $a^2 - b^2$, $a^2 \pm 2ab + b^2$, or split the middle term.

Division of polynomials: dividend = divisor $\times$ quotient + remainder

12. Introduction to graphs

- A point is written (x, y): x is across, y is up. A line graph shows change over time. A linear graph is a straight line.

13. Playing with numbers

- General form of a two-digit number: $10a + b$. Reversing it: $10b + a$. Their sum is $11(a + b)$.
- Divisibility rules: use them to find missing digits in puzzles.

14. Visualising solid shapes

Euler's formula: $F + V - E = 2$ (Faces + Vertices - Edges)

- Cube: 6 faces, 8 vertices, 12 edges. Check it with the formula.

Tip: Memorise the four algebraic identities and the mensuration table. They give many marks for little time.

Weekly plan for Class 8 maths

- Mon-Tue: new chapter; Wed: solve all examples; Thu-Fri: exercise questions; Sat: 20-mark mixed test; Sun: fix the mistakes.