

Class 7 Maths: Quick Revision and Formula Sheet

Rules, identities and formulas for Class 7, with simple examples.

1. Integers

- Same signs: add and keep the sign $(-3) + (-4) = -7$. Different signs: subtract and take the sign of the bigger number: $(-9) + 5 = -4$.
- Subtracting means adding the opposite: $6 - (-2) = 6 + 2 = 8$.
- Multiplication and division: same signs give positive, different signs give negative.

2. Fractions and decimals

$$a/b \times c/d = (a \times c)/(b \times d) \mid a/b \div c/d = a/b \times d/c$$

- To multiply decimals, ignore the decimal points, multiply, then place the point so the answer has as many decimal places as both numbers together.
- To divide by 10, 100, 1000 shift the decimal point left by 1, 2, 3 places.

3. Simple equations

- Solve by keeping both sides balanced. Example: $3x + 5 = 20$, so $3x = 15$, so $x = 5$.
- Check by putting the value back into the equation.

4. Lines and angles

- Vertically opposite angles are equal. Angles in a linear pair add to 180° .
- If two lines are parallel and cut by a transversal: corresponding angles are equal; alternate interior angles are equal; co-interior angles add to 180° .

5. The triangle and its properties

Angle sum = 180° | Exterior angle = sum of the two interior opposite angles

Pythagoras (right triangle): $a^2 + b^2 = c^2$, where c is the hypotenuse

- Sum of any two sides is greater than the third side.
- Median joins a vertex to the midpoint of the opposite side. Altitude is the perpendicular from a vertex to the opposite side.

6. Congruence of triangles

- Two triangles are congruent if they match exactly. Rules: **SSS**, **SAS**, **ASA**, **RHS** (right angle, hypotenuse, one side).
- Remember: AAA does not prove congruence (it gives similar shapes of different size).

7. Comparing quantities

$$\text{Percentage} = (\text{part} \div \text{whole}) \times 100$$

$$\text{Profit} = \text{SP} - \text{CP} \mid \text{Loss} = \text{CP} - \text{SP} \mid \text{Profit \%} = (\text{Profit} \div \text{CP}) \times 100$$

$$\text{Simple Interest} = (P \times R \times T) \div 100 \mid \text{Amount} = P + \text{SI}$$

8. Rational numbers

- A rational number is p/q with $q \neq 0$. Positive and negative fractions are both rational.

- To compare, convert to the same denominator or to decimals. Between any two rationals there are infinitely many more.

9. Perimeter and area

Circle: circumference = $2\pi r = \pi d$ | area = πr^2 ($\pi \approx 22/7$ or 3.14)

Triangle: $\frac{1}{2} \times b \times h$ | Parallelogram: $b \times h$

10. Algebraic expressions

- Like terms have the same variable part ($3x$ and $-5x$). Only like terms can be added or subtracted.
- Terms: monomial (1 term), binomial (2), trinomial (3). Value of an expression: substitute the number.

11. Exponents and powers

$a^m \times a^n = a^{m+n}$ | $a^m \div a^n = a^{m-n}$ | $(a^m)^n = a^{mn}$ | $a^0 = 1$

$(a \times b)^m = a^m \times b^m$

- Very large numbers can be written in standard form, e.g. $4,50,000 = 4.5 \times 10^5$.

12. Data handling and probability

Mean = $\text{sum} \div \text{count}$ | Range = highest – lowest

- **Median** is the middle value after arranging in order (average of two middle values if the count is even). **Mode** is the value that appears most often.

Probability of an event = $\text{favourable outcomes} \div \text{total outcomes}$ (always between 0 and 1)

13. Symmetry and solid shapes

- Rotational symmetry: a shape looks the same after turning less than 360° . Order = how many times it fits in one full turn.
- Solids have faces, edges and vertices. A cube has 6 faces, 12 edges and 8 vertices.

Tip: In every geometry question, draw a neat figure, mark the given facts, then pick the rule that matches.

Exam checklist

- Show the formula, then the working, then the answer with unit.
- Do a quick estimate to check if the answer looks sensible.
- Practise 3 word problems a day: percentage, interest, area.