

NCERT Class 9 Maths - Chapter 1

Number Systems: Formula Sheet

1. Rational Number: $r = p/q$, where $p, q \in \mathbb{Z}$ and $q \neq 0$.
2. Irrational Number: Cannot be expressed as p/q with integers p, q .
3. Real Numbers: Set of all rational and irrational numbers.
4. Decimal Expansions:
 - Rational $\rightarrow$ terminating or non-terminating recurring.
 - Irrational $\rightarrow$ non-terminating, non-recurring.
5. Laws of Exponents:
 - $a^m \times a^n = a^{(m+n)}$
 - $(a^m)^n = a^{(mn)}$
 - $(ab)^m = a^m \times b^m$
 - $a^0 = 1$
 - $a^{(-m)} = 1 / a^m$
 - $a^{(p/q)} = (q\sqrt[q]{a})^p$
6. Surds and Identities:
 - $\sqrt{a} \times \sqrt{b} = \sqrt{(ab)}$
 - $\sqrt{(a/b)} = \sqrt{a} / \sqrt{b}$
 - $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b}) = a - b$
 - $(\sqrt{a} + \sqrt{b})^2 = a + b + 2\sqrt{(ab)}$
7. Rationalisation Techniques:
 - $1/\sqrt{a} = \sqrt{a}/a$
 - $1/(\sqrt{a} + \sqrt{b}) \times (\sqrt{a} - \sqrt{b})/(\sqrt{a} - \sqrt{b})$
8. Square Root Spiral: Visual method for $\sqrt{2}, \sqrt{3}, \sqrt{4}, \dots$
9. Important Irrationals: $\sqrt{2} = 1.414\dots, \sqrt{3} = 1.732\dots, \pi = 3.14159\dots$