Chapter 1: Rational Numbers

Addition of Rational Numbers:

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

Subtraction of Rational Numbers:

$$\mathbf{(a/b) - (c/d) = (ad - bc) / bd}$$

Multiplication of Rational Numbers:

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

Division of Rational Numbers:

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

Chapter 2: Linear Equations in One Variable

Standard Form of a Linear Equation:

$$ax + b = 0$$

Solving Linear Equations:

$$x = -b / a$$

Chapter 3: Understanding Quadrilaterals

Sum of Interior Angles:

Sum of angles of a quadrilateral=360∘

Sum of angles of a quadrilateral} = 360∘

Sum of angles of a quadrilateral=360∘

Area of Parallelogram:

base × height

Area of Rectangle/Square:

length × breadth

Area of square

side × side

Chapter 4: Practical Geometry

Construction of a Triangle when Sides are Given (SSS, SAS, ASA):

Triangle Construction Rules:

- SSS (Side-Side-Side)
- SAS (Side-Angle-Side)
- ASA (Angle-Side-Angle)

Chapter 5: Data Handling

Mean:

(Sum of values) / (Number of values)

Median:

- Arrange data in ascending or descending order, then:
  - If odd number of values: Middle value.
  - If even number of values: Average of two middle values.

Mode:

- The value that appears most frequently in the data.

Chapter 6: Square and Square Roots

Square of a Number:

a^2

Square Root of a Perfect Square:

$\sqrt{a}$

Square Root of Non-Perfect Square: Approximation by long division method.

Chapter 7: Cube and Cube Roots

Cube of a Number:

Cube of a= a^3

Cube Root of a Number:

Cube root of a = $\sqrt[3]{a}$

Chapter 8: Comparing Quantities

Percentage:

(Value / Total) × 100

Simple Interest (SI):

(SI) = (P × R × T) / 100

Profit/Loss Percentage:

(Profit / Cost Price) × 100

(Loss / Cost Price) × 100

Chapter 9: Algebraic Expressions and Identities

Standard Identities:

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

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

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

Chapter 10: Visualizing Solid Shapes

Surface Area of Cube = $6a^2$

Surface Area of Cuboid = $2(lb + bh + hl)$

Volume of Cube = a^3

Volume of Cuboid = $l \times b \times h$

Chapter 11: Mensuration

Area of Circle = πr^2

Circumference of Circle = $2\pi r$

Surface Area of Sphere = $4\pi r^2$

Volume of Sphere = $(4/3)\pi r^3$

Chapter 12: Exponents and Powers

Laws of Exponents:

- a^m × a^n = a^(m + n)
- a^m / a^n = a^(m - n)
- (a^m)^n = a^(m × n)

Special Case:-

$a^0 = 1$ (for $a \neq 0$)

a^(-m) = 1 / a^m