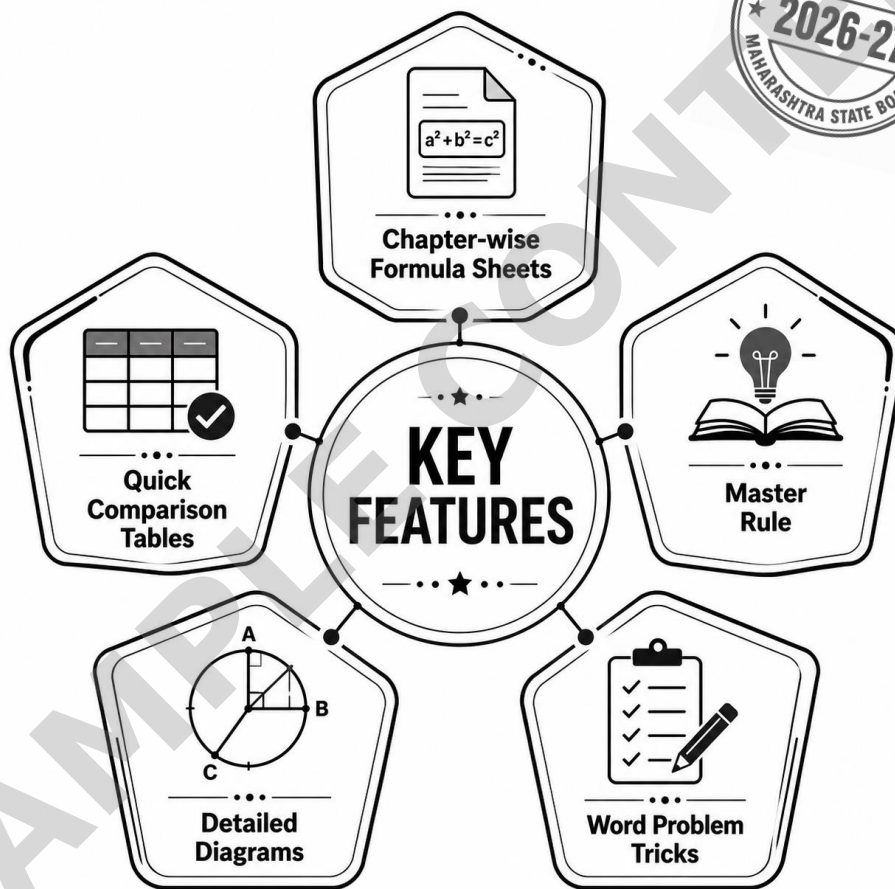


STANDARD SIX

(English & Semi-English Medium)

MATHEMATICS FORMULA BOOK



HOW TO USE THIS FORMULA BOOK

1	UNDERSTAND FIRST, THEN MEMORISE Don't just mug up a formula — understand where it comes from, before you memorise it. आधी समजून घ्या, मग पाठ करा फक्त घोळं पट्टी करू नका — फॉर्म्युला कुठून येतो हे आधी समजून घ्या, मग तो लक्षात ठेवा.
2	10-MINUTE DAILY REVISION Before starting a new chapter, spend 10 minutes revising the formulas of the previous one. रोज १० मिनिटं Revision करा नवीन धडा सुरू करण्याआधी, आधीच्या धड्याच्या फॉर्म्युलांची १० मिनिटं उजळणी करा.
3	SOLVE ONE SUM PER FORMULA Reading a formula is not enough — solve at least one problem using it yourself. प्रत्येक Formula साठी एक Sum सोडवा फक्त फॉर्म्युला वाचून उपयोग नाही — तो वापरून किमान एक उदाहरण स्वतः सोडवा.
4	STUDY THE DIAGRAM, THEN DRAW IT Look at every diagram carefully, then practice drawing it yourself in your notebook. Diagram नीट बघा, मग स्वतः काढा प्रत्येक diagram नीट बघा, मग तो स्वतःच्या वहीत काढण्याचा सराव करा.
5	REDO YOUR MISTAKES Go back to the sums you got wrong and solve them again — that's where the real learning happens. चुकलेले Examples परत सोडवा जिथे चूक झाली तिथले Examples परत सोडवा — तिथेच खरं शिकणं होतं.
6	KEEP THIS BOOK WITH YOU ALWAYS On the last day before the exam, revise ONLY this formula book — not the entire textbook. हे पुस्तक नेहमी जवळ ठेवा परीक्षेच्या आदल्या दिवशी फक्त हेच Formula Book वाचा — संपूर्ण पाठ्यपुस्तक नको.
7	PRACTICE FOR SPEED Keep recalling formulas quickly so that you can finish all questions within the exam time. Speed साठी सराव करा फॉर्म्युला पटकन आठवण्याचा सराव करा, जेणेकरून वेळेत सगळे प्रश्न सुटतील.

PREFACE

Mathematics is not just a subject of numbers — it is a subject of logic, patterns and problem-solving. With this vision, Sanskruti Publications has prepared this Formula Book strictly according to the Maharashtra State Board New Syllabus (2026–27) to make Mathematics learning simple, systematic and result-oriented.

This book has been specially designed as a quick-revision companion for students. Every chapter's formulas, definitions and rules are presented on a single glance-friendly page, supported by clear, hand-crafted diagrams for every important concept — from geometry and shapes to number patterns, so that ideas that are usually hard to visualise become easy to understand and remember.

The book includes Chapterwise Formulas, Step-by-step Master Rules, Quick Comparison Tables, Worked Examples, and Diagram-based explanations for every topic — helping students strengthen their concepts, recall formulas instantly during revision, and solve problems with confidence.

Every formula, diagram and example in this book has been carefully prepared and reviewed by the academic team of Sanskruti Publications. Our objective is to give students one reliable, compact resource that supports classroom learning and boosts confidence for school examinations.

We firmly believe that consistent revision of formulas, supported by visual understanding, is the key to excellence in Mathematics. We hope this book becomes a trusted companion throughout the academic year for every student.

We sincerely thank our teachers, students and parents for their continuous trust and support.

Best Wishes,
Academic Team
SANSKRUTI PUBLICATIONS

DISCLAIMER

This book has been prepared by Sanskruti Publications as a supplementary study material based on the Maharashtra State Board New Syllabus (2026–27). Every effort has been made to ensure the accuracy of the content; however, inadvertent errors or omissions may occur. Students are advised to refer to the prescribed Maharashtra State Board textbooks and official notifications wherever necessary. This book is intended solely for educational purposes and is not a substitute for the prescribed textbook. No part of this publication may be reproduced or distributed without the prior written permission of Sanskruti Publications.

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Chapter 1 : Three-Dimensional Shapes

1. 2D vs 3D — Basic Idea

- Two-Dimensional shape (2D): occupies space on a flat surface. It has Length and Width only (e.g. square, triangle, circle).
- Three-Dimensional shape (3D): occupies space all around. It has Length, Width and Height (e.g. cube, sphere, cone).

2. Elements — 2D vs 3D

Element	Two-Dimensional Shape	Three-Dimensional Shape
Vertex	Common point of two sides	Common point of three or more edges
Side / Edge	Line segment joining two adjacent vertices (called a side)	Common line where two surfaces meet (called an edge)
Face / Surface	Has only ONE surface	Formed by combination of MANY surfaces (faces)

3. Polygons (2D closed figures)

A polygon is a closed figure with three or more straight sides.

Name	No. of Sides	No. of Vertices
Triangle	3	3
Quadrilateral	4	4
Pentagon	5	5
Hexagon	6	6
Heptagon	7	7

Note: Number of sides = Number of vertices, always, for any polygon.

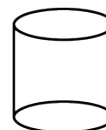
4. Prisms — vertices, faces, edges



Cuboid



Triangular Prism

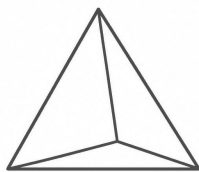


Cylinder

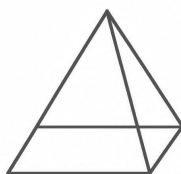
Solid	Vertices	Faces	Edges
Triangular Prism	6	5 (2 triangular + 3 rectangular)	9
Cuboid (Rectangular Prism)	8	6	12
Cylinder (Circular Prism)	0	2 circular + 1 curved	2 circular edges

Rule for any Prism: top face = bottom face (same shape) and vertical faces are rectangles.

5. Pyramids



Triangular Pyramid



Square Pyramid

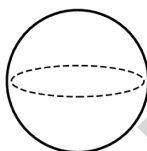
Solid	Vertices	Faces	Edges
Triangular Pyramid	4	4 (all triangular)	6
Square Pyramid	5	5 (1 square + 4 triangular)	8

Rule for any Pyramid: bottom face is a polygon; all vertical (side) faces are triangles meeting at ONE top vertex.

6. Cone and Sphere



Cone



Sphere

- Cone: 1 circular face + 1 curved face, 1 vertex, 1 circular edge.
- Sphere: only 1 curved surface — NO edges and NO vertices (like a ball, laddoo).

7. Prism vs Pyramid — Difference

	Prism	Pyramid
Top & Bottom faces	Both same shape (triangle/square/polygon); vertical faces are RECTANGLES	Bottom is a polygon; vertical faces are TRIANGLES meeting at a point
Vertices	Present on both top and bottom surfaces	One vertex at top; remaining vertices at the bottom
Edges	$3 \times (\text{number of sides of base})$	$2 \times (\text{number of sides of base})$

8. Quick Reference Box

★ Golden Rule for any Prism/Pyramid ★

Prism edges = $3 \times$ sides of base face

Pyramid edges = $2 \times$ sides of base face

Sphere $\rightarrow$ 0 edges, 0 vertices, 1 curved surface

Prism Vertices = $2 \times$ (base sides)

Prism Faces = (base sides) + 2

Pyramid Vertices = (base sides) + 1

Pyramid Faces = (base sides) + 1

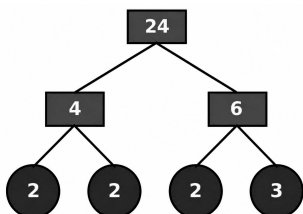


Chapter 5 : GCD and LCM

1. Basic Definitions

- **Divisor (Factor):** A number that divides another number exactly (remainder 0) is called a divisor or factor of that number.
- **Multiple:** A number that is exactly divisible by another number is called a multiple of that number.
- **Prime factor:** A factor of a number which is itself a prime number is called a prime factor.

2. Finding Prime Factors — Two Methods

Horizontal Arrangement (Factor Tree)	Vertical Arrangement (Division Method)										
Example: $24 = 2 \times 12 = 2 \times 2 \times 6 = 2 \times 2 \times 2 \times 3$ Prime factors of 24 $\rightarrow 2, 3$  <pre> graph TD 24[24] --- 4[4] 24 --- 6[6] 4 --- 2_1((2)) 4 --- 2_2((2)) 6 --- 2_3((2)) 6 --- 3((3)) </pre>	Prime factors of 24 = $2 \times 2 \times 2 \times 3$ Prime factors of 24 $\rightarrow 2, 3$ <table> <tr><td>2</td><td>24</td></tr> <tr><td>2</td><td>12</td></tr> <tr><td>2</td><td>6</td></tr> <tr><td>3</td><td>3</td></tr> <tr><td></td><td>1</td></tr> </table>	2	24	2	12	2	6	3	3		1
2	24										
2	12										
2	6										
3	3										
	1										

3. GCD (Greatest Common Divisor) / H.C.F.

GCD = The largest number that divides two (or more) given numbers exactly.

Method	How to apply
① Divisor Method	List all divisors of each number $\rightarrow$ pick the common divisors $\rightarrow$ the greatest one is the GCD.
② Prime Factorisation Method	Write each number as a product of prime factors $\rightarrow$ GCD = product of the COMMON prime factors only.
③ Division Method (Euclid)	Divide the larger number by the smaller. Then divide the previous divisor by the remainder. Repeat till remainder = 0. The LAST divisor = GCD.

Example (Division method): GCD of 24 and 36

$36 \div 24 \rightarrow$ remainder 12 $\rightarrow 24 \div 12 \rightarrow$ remainder 0 $\rightarrow$ GCD = 12

4. LCM (Least Common Multiple)

LCM = The smallest number that is exactly divisible by two (or more) given numbers.

Method	How to apply
① Listing Method	Write the multiples of each number $\rightarrow$ the smallest common multiple is the LCM.
② Prime Factorisation Method	Write each number as prime factors $\rightarrow$ LCM = product of ALL common AND uncommon prime factors.
③ Common Division (Vertical Layout) Method	Divide all numbers together by a common prime, write quotients below; repeat till all quotients are 1. LCM = product of ALL the divisors used.

Example (Prime factorisation): LCM of 8, 12, 16

$$8 = 2 \times 2 \times 2, \quad 12 = 2 \times 2 \times 3, \quad 16 = 2 \times 2 \times 2 \times 2$$

$$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 3 = 48$$

5. Golden Relation**★ Master Formula ★**

$$\text{Product of two numbers} = \text{GCD} \times \text{LCM}$$

6. Quick Comparison

	GCD	LCM
Full form	Greatest Common Divisor	Least Common Multiple
Value is	Smaller than or equal to the smallest given number	Greater than or equal to the largest given number
Uses factors of	Common prime factors only	Common + uncommon prime factors
Used for word problems on	Maximum equal size/length/group (cutting rods, tiling, arranging in rows)	Minimum common time/event (bells ringing together, buses leaving together, laps meeting)

7. Word-Problem Trick (Kevha GCD, kevha LCM?)

- Question sathi 'maximum / equal pieces / largest group / same size tile' asa shabda asel → GCD vapra.
- Question sathi 'minimum / together again / same time / smallest number divisible by all' asa shabda asel → LCM vapra.

