VIKRAMADITYA ACADEMY

Sainik School • Rashtriya Military School • RIMC Coaching

CLASS 6th

CLASS 6th

ENTRANCE EXAM 2027



INSIDE THIS BOOK

- **119** Short Tricks
- **PYQs** RMS 2013–25 • AISSEE 2016–26
- **Step-by-Step** Solutions for every example

A COMPLETE BOOK FOR

MATHEMATICS

SAINIK SCHOOL & RMS

AISSEE • RMS CET

Strictly as per the Official Syllabus of RMS & Sainik School Society (NTA) • English Medium

27	100%	891+	1609 MCQs
Chapters	Syllabus Covered	Solved Examples	with Answer Keys

Number System & Arithmetic
Number System • Roman Numerals • Factors & Primes • HCF–LCM • Fractions • Decimals • Squares & Cubes

₹ Commercial Maths
Unitary Method • Ratio • Percentage • Profit & Loss • Simple Interest • Average • Time & Work • Speed & Distance

Geometry & Mensuration
Lines & Angles • Plane Figures • Circle • Perimeter & Area • Volume • Units • Temperature • Data Handling

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ABOUT THIS BOOK & EXAM PATTERN

This book covers the **complete Class VI Mathematics syllabus** of the All India Sainik Schools Entrance Examination (AISSEE) and the Rashtriya Military Schools Common Entrance Test (RMS CET). Every chapter has five parts:

1. **Theory & Formulae** – concepts, tables and exam tips.
2. ⚡ **Short Tricks** – 119 shortcuts in all, each applied to examples and previous-year questions.
3. **Solved Examples** – full step-by-step solutions (Step 1, Step 2 …); wherever a shortcut works, the short trick is also shown.
4. **Practice Questions** – MCQs grouped by question type, with every PYQ marked by a tag such as AISSEE 2019 or RMS 2022.
5. **Answer Key** with hints for the tricky questions.

Previous-year papers used: **RMS CET Class VI 2013–2025** and **AISSEE Class VI 2016–2022 & 2026**, together with the Academy's practice sets and mock tests. All answers have been worked out and checked again.

AISSEE 2027 – Class VI (Pen-paper, OMR, 150 minutes, no negative marking)

Section	Subject	Questions	Marks each	Total
A	Language	25	2	50
B	**Mathematics**	**50**	**3**	**150**
C	Intelligence	25	2	50
D	General Knowledge	25	2	50
Total		**125**		**300**

RMS CET – Class VI (2 hours 30 minutes, bilingual paper)

Subject	Questions	Max Marks	Min % to qualify
English (qualifying only)	50	50	35%
Intelligence Test	50	50	40%
Mathematics	**50**	**50**	**40%**
General Knowledge & Current Affairs	50	50	40%
Interview	–	20	–

In RMS CET, if marks are tied, the candidate with **higher Mathematics marks** gets preference. RMS CET is of Class V standard for Class VI admission. (Source: official AISSEE 2027 and RMS CET information bulletins.)

OFFICIAL SYLLABUS – AISSEE 2027 • CLASS VI MATHEMATICS

Appendix II of the AISSEE 2027 Information Bulletin (NTA) – 50 questions, 150 marks. The last column shows the chapter of this book where each topic is covered.

S. No.	Topic (official)	Chapter
1	Natural Numbers	Ch 1
2	LCM and HCF	Ch 5
3	Unitary Method	Ch 11
4	Fractions	Ch 6
5	Ratio and Proportion	Ch 12
6	Profit and Loss	Ch 14
7	Simplification	Ch 8
8	Average	Ch 16
9	Percentage	Ch 13
10	Area and Perimeter	Ch 25
11	Simple Interest	Ch 15
12	Lines and Angles	Ch 22
13	Complementary and Supplementary Angles	Ch 22
14	Conversion of Units	Ch 19
15	Roman Numerals	Ch 2
16	Types of Angles	Ch 22
17	Circle	Ch 24
18	Volume of Cube and Cuboids	Ch 26
19	Prime and Composite Numbers	Ch 4
20	Plane Figures	Ch 23
21	Decimal Numbers	Ch 7
22	Speed and Time	Ch 18
23	Operation on Numbers	Ch 3
24	Temperature	Ch 20
25	Arranging of Fractions	Ch 6

OFFICIAL SYLLABUS – RMS CET • CLASS VI MATHEMATICS

"Broader syllabus for RMSs", Class VI, Mathematics (RMS CET Information Bulletin). The last column shows the chapter(s) of this book.

S. No.	Topic (official)	Chapter(s)
1	Arithmetic Operations	Ch 3
2	Capacity (Volume)	Ch 19, 26
3	Data Handling	Ch 27
4	Fractional Numbers	Ch 6
5	Geometry: Shapes & Spatial Understanding	Ch 22, 23
6	Measurement	Ch 19
7	Mental Arithmetic	Ch 3, 9
8	Money	Ch 19
9	Number System (Whole Number, Natural Number, Playing with Numbers)	Ch 1, 4
10	Pattern	Ch 21
11	Time	Ch 19
12	Weight	Ch 19
13	LCM & HCF	Ch 5
14	Unitary Method	Ch 11
15	Fractions	Ch 6
16	Ratio and Proportion	Ch 12
17	Profit and Loss	Ch 14
18	Simplification	Ch 8
19	Average	Ch 16
20	Percentage	Ch 13
21	Simple Interest	Ch 15
22	Conversion of Units	Ch 19
23	Roman Numerals	Ch 2
24	Types of Angles	Ch 22
25	Circle	Ch 24
26	Volume of Cube and Cuboids	Ch 26
27	Prime and Composite Numbers	Ch 4
28	Plane Figures	Ch 23
29	Speed and Time	Ch 18
30	Operation on Numbers	Ch 3
31	Temperature	Ch 20

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	Total	**891**	**1609**	

CHAPTER 01

Number System

Indian & International System • Place Value • Forming Numbers • Natural, Whole Numbers & Integers

THEORY & FORMULAE

1. Digits and Numerals

We use ten symbols called **digits**: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. A group of digits that represents a number is called a **numeral**. Writing a number in figures is called **notation** and writing it in words is called **numeration**.

2. Indian (Hindu-Arabic) Place Value System

Starting from the right, the places are grouped into **periods**: Ones (3 places), Thousands (2), Lakhs (2), Crores (2).

Crores		Lakhs		Thousands		Ones		
TC	C	TL	L	TTh	Th	H	T	O
10^8	10^7	10^6	10^5	10^4	10^3	100	10	1

Commas (Indian): first comma after 3 digits from the right, then after every 2 digits. Example: 6,05,40,032 = Six crore five lakh forty thousand thirty-two.

3. International Place Value System

Periods of 3 places each: Ones, Thousands, Millions, Billions.

Millions			Thousands			Ones		
HM	TM	M	HTh	TTh	Th	H	T	O

Commas (International): after every 3 digits from the right. Example: 48,207,015 = Forty-eight million two hundred seven thousand fifteen.

Conversions to remember

Indian	International
1 lakh = 1,00,000	100 thousand
10 lakh	1 million
1 crore	10 million
10 crore	100 million
100 crore	1 billion

4. Face Value and Place Value

- **Face value** of a digit = the digit itself, wherever it is.
- **Place value** = face value × value of its place.
- In 4,37,215 : face value of 7 = 7, place value of 7 = 7 × 1000 = 7000.
- Place value of **0** is always 0.
- Place value − Face value of 7 in 329075 = 70 − 7 = 63.

5. Expanded Form

4,07,085 = 4 × 1,00,000 + 7 × 1000 + 8 × 10 + 5 × 1 = 4 lakh + 7 thousand + 8 tens + 5 ones. **Trap:** 12 thousands + 15 hundreds + 18 tens = 12000 + 1500 + 180 = 13,680 (carry over!).

6. Counting Numbers of a Given Size

Digits	Smallest	Greatest	How many
1	1	9	9
2	10	99	90
3	100	999	900
4	1000	9999	9000
5	10000	99999	90000
n	10^{n-1}	$10^n - 1$	$9 \times 10^{n-1}$

- Numbers from a to b (both included) = b − a + 1.
- Smallest (n+1)-digit number − greatest n-digit number = **1**.

7. Successor and Predecessor

- Successor of n = n + 1; Predecessor of n = n − 1.
- Successor − Predecessor = 2 (always).
- Successor of 1 million = 1000001; Predecessor of 1 lakh = 99999.
- 0 has no predecessor among whole numbers; 1 has no predecessor among natural numbers.

8. Forming Numbers from Given Digits

- **Greatest number:** write digits in descending order.
- **Smallest number:** write digits in ascending order, but **0 can never be first** – put the smallest non-zero digit first, then 0.
- **Repetition allowed, each digit at least once:** for the greatest, repeat the biggest digit; for the smallest, repeat 0 (or the smallest digit) right after the first digit.
- **Even number:** units digit must be 0, 2, 4, 6 or 8. **Odd number:** units digit 1, 3, 5, 7 or 9.
- For the *greatest even*, keep the smallest even digit at the units place; for the *smallest odd*, try each odd digit at units and pick the smallest result.

Example: digits 6, 0, 4, 9, 1 → greatest even = 96410, smallest odd = 10469 (not 40691!).

9. Comparing Numbers

1. More digits ⇒ greater number.
2. Same number of digits ⇒ compare from the left; the first place where digits differ decides.

10. Natural Numbers and Whole Numbers

- **Natural numbers:** 1, 2, 3, ... (counting numbers). Smallest = 1, no greatest.
- **Whole numbers:** 0, 1, 2, 3, ... Smallest whole number = 0.
- Every natural number is a whole number; 0 is a whole number but **not** a natural number.
- Number of whole numbers less than n = n.
- Sum/product of two whole numbers is a whole number (**closure**). Subtraction and division are **not** closed (5 − 8, 5 ÷ 2).
- a + 0 = a (0 is the additive identity); a × 1 = a (1 is the multiplicative identity); a × 0 = 0; 0 ÷ a = 0 (a ≠ 0); **a ÷ 0 is not defined**.
- The product of a number and its successor is always **even**.

11. Integers and the Number Line

- Integers: ..., −3, −2, −1, 0, 1, 2, 3, ...
- On the number line, numbers increase to the right. "3 less than −2" means move 3 steps left: −5.
- Greatest negative integer = −1; 0 is neither positive nor negative.
- Adding a negative = subtracting: 1106 + (−855) = 251. Subtracting a negative = adding: (−10) − (−4) = −6.

Exam tips (Sainik & RMS)

- Read "Indian" vs "International" carefully in number-name questions.
- In "how many" questions, include both ends only if the question says "from ... to ...".
- For interchange questions, write the new number fully and then subtract/add.

⚡ SHORT TRICKS & SHORTCUTS (with PYQ applications)

Trick 1 — Count n-digit numbers in one step

Number of n-digit numbers = 9 followed by (n − 1) zeros. Numbers from a to b (both included) = b − a + 1.

Q. How many 5-digit numbers are there?
Trick: 9 followed by 4 zeros = **90000**.

Q. Difference between the largest and smallest five-digit numbers. RMS 2020
Trick: Largest − smallest = (how many) − 1 = 90000 − 1 = **89999**.

Trick 2 — Successor/Predecessor shortcuts

Successor − Predecessor = 2 always. Successor × Predecessor of n = $n^2 - 1$.

Q. Product of the successor and predecessor of 999. RMS 2024
Trick: $999^2 - 1 = 998001 - 1 =$ **998000**.

Trick 3 **Reversed two-digit numbers change by 9 × (difference of digits)**

(10a + b) − (10b + a) = 9(a − b). So the change is always a multiple of 9.

Q. Which two-digit number gets its digits reversed when 27 is added? (a) 27 (b) 24 (c) 47 (d) 70 AISSEE 2019

Trick: 27 ÷ 9 = 3 ⇒ units digit is 3 more than tens digit. Only 47 fits ⇒ **47**.

Trick 4 **Greatest even / smallest odd in 10 seconds**

Greatest even: put the smallest even digit at the units place, rest in descending order. Smallest odd: try the smallest-making odd digit at units, rest ascending (0 not first).

Q. Using 6, 0, 4, 9, 1 (once each), greatest even − smallest odd = ?

Trick: Greatest even = 9641**0**; smallest odd = 1046**9** ⇒ 96410 − 10469 = **85941**.

Trick 5 **Interchanging two digits – use place values only**

Change = (difference of the two digits) × (difference of their place values). No need to write the new number.

Q. Difference between 36490 and the number obtained by interchanging 6 and 9. AISSEE 2018

Trick: Digits differ by 3; places: 1000 and 10 ⇒ 3 × (1000 − 10) = **2970**.

SOLVED EXAMPLES (41 examples)

Example 1. Write 6,05,40,032 in words (Indian system) and 48,207,015 in words (International system).

Solution: Step 1: Indian periods from the right: Crores | Lakhs | Thousands | Ones ⇒ 6 | 05 | 40 | 032.

Step 2: Read each period with its name: 6 crore, 5 lakh, 40 thousand, 32.

Step 3: International periods: Millions | Thousands | Ones ⇒ 48 | 207 | 015.

Answer: Six crore five lakh forty thousand thirty-two; Forty-eight million two hundred seven thousand fifteen.

Example 2. Seventy-six lakh four thousand eighty-three is written as _____ in the International number system. AISSEE 2022

Solution: Step 1: Write in Indian figures: 76 lakh = 76,00,000; + 4,000 + 83 = 76,04,083.

Step 2: Remove commas: 7604083. Put commas after every 3 digits from the right: 7,604,083.

Answer: **7,604,083**.

Example 3. Write "Nine crore forty thousand seven" in figures.

Solution: Step 1: Make the place chart: Crores = 9, Lakhs = 00, Thousands = 40, Ones = 007.

Step 2: Join them: 9 | 00 | 40 | 007.

Answer: **9,00,40,007 = 90040007**.

Example 4. How many lakhs make one million? How many millions make one crore? RMS 2014

Solution: Step 1: 1 million = 10,00,000 = 10 × 1,00,000 = 10 lakh.

Step 2: 1 crore = 1,00,00,000 = 10,000,000 = 10 × 1,000,000 = 10 million.

⚡ **Short Trick:** Remember "10 – 10": 10 lakh = 1 million and 10 million = 1 crore.

Answer: **10 lakh; 10 million**.

Example 5. Find the place value of 5 in 70,504 and of 7 in 874213. RMS 2017, 2020

Solution: Step 1: In 70,504 the digit 5 is at the hundreds place ⇒ 5 × 100 = 500.

Step 2: In 874213 the digit 7 is at the ten-thousands place ⇒ 7 × 10000 = 70000.

⚡ **Short Trick:** Place value = digit followed by as many zeros as there are digits to its right. 5 has 2 digits after it ⇒ 500; 7 has 4 ⇒ 70000.

Answer: **500 and 70000**.

Example 6. What is the difference between the place value and the face value of 7 in 329075? RMS 2022

Solution: Step 1: 7 is at the tens place ⇒ place value = 70.

Step 2: Face value = 7.

Step 3: 70 − 7 = 63.

⚡ **Short Trick:** Difference = face value × (place − 1) = 7 × 9 = 63.

Answer: **63**.

Example 7. In 563672, the place value of 6 at the ten-thousands place is how many times the place value of 6 at the hundreds place? AISSEE 2022

Solution: Step 1: Place values: 60000 and 600.

Step 2: 60000 ÷ 600 = 100.

⚡ **Short Trick:** Count places between them: ten-thousands to hundreds is 2 places ⇒ 10^2 = 100.

Answer: **100 times**.

Example 8. Find the difference between the place values of the two 8s in 48,328.

Solution: Step 1: First 8 is at the thousands place ⇒ 8000.

Step 2: Second 8 is at the ones place ⇒ 8.

Step 3: 8000 − 8 = 7992.

Answer: **7992**.

Example 9. Write 12 thousands + 15 hundreds + 18 tens + 6 ones as a numeral.

Solution: Step 1: Change each part to a number: 12000, 1500, 180, 6.

Step 2: Add: 12000 + 1500 = 13500; + 180 = 13680; + 6 = 13686.

Answer: **13,686** (writing digits side by side, 1215186, is wrong).

Example 10. I am a five-digit number. My ten-thousands digit is 3 less than my tens digit; my hundreds digit is half the ten-thousands digit; my thousands digit is double my ones digit. Who am I? (a) 68494 (b) 61392 (c) 64391 (d) 68394 AISSEE 2022

Solution: ⚡ **Short Trick:** Don't build the number – test the options one condition at a time.

Step 1: Condition 1 (TTh = T − 3): 68494 → 6 = 9 − 3 ✔; 61392 → 6 ≠ 6 ✘; 64391 → 6 ≠ 6 ✘; 68394 → 6 = 9 − 3 ✔.

Step 2: Condition 2 (H = TTh ÷ 2 = 3): 68494 has H = 4 ✘; 68394 has H = 3 ✔.

Step 3: Condition 3 for 68394: Th = 8 = 2 × 4 ✔.

Answer: **68394**.

Example 11. How many 5-digit numbers are there? How many 3-digit numbers?

Solution: Step 1: 5-digit numbers run from 10000 to 99999 ⇒ 99999 − 10000 + 1 = 90000.

Step 2: 3-digit numbers: 100 to 999 ⇒ 999 − 100 + 1 = 900.

⚡ **Short Trick:** n-digit numbers = 9 followed by (n − 1) zeros.

Answer: **90000; 900**.

Example 12. Find the difference between the largest 7-digit number and the smallest 6-digit number. RMS 2024

Solution: Step 1: Largest 7-digit = 9999999; smallest 6-digit = 100000.
Step 2: 9999999 − 100000 = 9899999 (only the lakh digit changes from 9 to 8).
Answer: **9899999**.

Example 13. Find the product of the successor and the predecessor of 999. RMS 2024

Solution: Step 1: Successor = 1000, predecessor = 998.
Step 2: 1000 × 998 = 998000.
⚡ Short Trick: $(n + 1)(n - 1) = n^2 - 1 = 998001 - 1 = 998000$.
Answer: **998000**.

Example 14. P is a natural number. Find the difference between its successor and predecessor. RMS 2015

Solution: Step 1: Successor = P + 1, predecessor = P − 1.
Step 2: (P + 1) − (P − 1) = P + 1 − P + 1 = 2.
Answer: **2** (always, for any number).

Example 15. The greatest 8-digit number formed with 5, 8, 7, 5, 2, 0, 6 and 1 is: AISSEE 2018, RMS 2023

Solution: Step 1: For the greatest number arrange all digits in descending order.
Step 2: 8 > 7 > 6 > 5 = 5 > 2 > 1 > 0 ⇒ 87655210.
Answer: **87655210**.

Example 16. Find the difference between the greatest and the least number formed by 6, 2, 7, 4, 3 (each once). AISSEE 2020

Solution: Step 1: Greatest = digits in descending order = 76432.
Step 2: Least = digits in ascending order = 23467.
Step 3: 76432 − 23467 = 52965.
⚡ Short Trick: Check the unit digit: 2 − 7 needs borrowing ⇒ 12 − 7 = 5 ⇒ only option ending in 5 is 52965.
Answer: **52965**.

Example 17. Form the smallest four-digit number using 0, 1, 2, 3 without repetition. RMS 2016

Solution: Step 1: Ascending order gives 0123, but a number cannot start with 0.
Step 2: Put the smallest non-zero digit (1) first, then 0, then the rest in ascending order: 1 0 2 3.
Answer: **1023**.

Example 18. Choose the smallest 7-digit number using each of 5, 1, 8, 0, 3 (digits may repeat). AISSEE 2022

Solution: Step 1: We need 7 places but only 5 digits − 2 digits will repeat.
Step 2: First place: smallest non-zero digit 1.
Step 3: Fill the next places with 0 (the smallest digit) as long as we still have room for 3, 5, 8: 1 0 0 0 _ _ _.
Step 4: Remaining digits in ascending order: 3, 5, 8 ⇒ 1000358.
Answer: **1000358**.

Example 19. Find the sum of the smallest and greatest five-digit numbers formed by 5, 0, 8, 9, 2 (each once). RMS 2020, 2021

Solution: Step 1: Greatest = 98520.
Step 2: Smallest: 0 cannot be first ⇒ 2 first, then 0, 5, 8, 9 ⇒ 20589.
Step 3: 98520 + 20589 = 119109.
Answer: **119109**.