Perfect Composite Mathematics

Including Activity Worksheets

CLASS - IV

[In accordance with the latest NCF prepared by the NCERT, New Delhi]

SPECIAL EDITION FOR ARMY SCHOOLS

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Preface

This book is one from the series New Perfect Composite Mathematics and is based on the syllabus developed by the National Council of Educational Research and Training (NCERT), New Delhi.

The subject matter is produced in such a way that it relates to the environment and focuses on the development and understanding of the students. It also aims to improve their thinking and reasoning skills. All books in this series are activity based and are written in a simple language.

The subject matter has been presented in graded form. The age, the learning ability and the mathematical difficulties faced by the students at all levels have been kept in mind while presenting difficult concepts.

The syllabus includes the four fundamental operations, namely, addition, subtraction, multiplication and division. These operations have been dealt in a step-by-step approach to enable students understand exactly what is to be done. The traditional and stereotype questions have been avoided.

Salient Features of this book are:

- The book covers the entire prescribed syllabus.
- Number system up to 6 digits has been explained. Reading and Writing of Roman Numerals up to 39 has been included.
- Lattice and standard multiplication algorithm has been given.
- Formation of mathematical stories or word problems has been taught.
- Paper folding method has been explained in geometry.
- Shapes have been created by using Tangrams.
- Use of tiling the floors has been explained with examples.
- Making of 4-faced and 6-faced cubes from given nets have also been included.
- Dot papers have been used to draw nets of cubes and cuboids.
- Drawing the plan, elevation and side view of simple objects has been explained in a systematic way.
- Method of finding area by using square paper has been used.
- Lab Activities have been included to make the subject interesting for the students.
- Challenging problems under the heading “Challenge” have also been included.
- Four model papers, two term-wise papers and one final examination paper covering the entire syllabus have been given for practice.
- A few high level questions have been given under the head “Put on Your Thinking Cap”.
- The questions in the chapter “Let us Get Ready for Examination” are given to enable the students to revise the syllabus before the final examination.

The books of the series will surely prove to be useful for the students.

I would like to thank Mrs. Sunita Jai Singh and Mrs. Shuchi Goyal for their valuable suggestions which helped me in bringing the series in the present form.

Last but not the least, I am thankful to the publishers who have taken great pains in making the books reader-friendly.

Suggestions for further improvement of the series will be gratefully acknowledged.

AUTHOR
Syllabus

Geometry (16 hrs.)

Shapes and Spatial Understanding
- Draw a circle free hand and with compass.
- Identifies centre, radius and diameter of a circle.
- Uses Tangrams to create different shapes.
- Tiles geometrical shapes: using one or two shapes.
- Chooses a tile among a given number of tiles that can tile a given region both intuitively and experimentally.
- Explores intuitively the area and perimeter of simple shapes.
- Makes 4-faced, 5-faced and 6-faced cubes from given nets especially designed for the same.
- Explores intuitively the reflections through inkblots, paper cutting and paper folding.
- Reads and draws 3-D objects, making use of the familiarity with the conventions used in this.
- Draws intuitively the plan, elevation and side view of simple objects.

Numbers (40 hrs.)

Numbers and Operations
- Writes multiplication facts.
- Writes tables up to 10 × 10.
- Multiplies two and three digit numbers using lattice algorithm and the standard (column) algorithm.
- Divides a given number by another number in various ways such as:
  - by drawing dots.
  - by grouping.
  - by using multiplication facts.
  - by repeated subtraction.
- Applies the four operations to life situations.
- Frames word problems.
- Estimates sums, differences and products of given numbers.

Mental Arithmetic
- Adds and subtracts multiples of 10 and 100, mentally.
- Completes multiplication facts by adding partial products, mentally (e.g. 7 × 6 = 5 × 6 + 2 × 6).

Fractional Numbers
- Identifies half, one-fourth and three-fourths of a whole.
- Identifies the symbols, \( \frac{1}{2}, \frac{1}{4}, \frac{3}{4} \).
- Explains the meaning of \( \frac{1}{2}, \frac{1}{4} \) and \( \frac{3}{4} \).
- Appreciates equivalence of $\frac{2}{4}$ and $\frac{1}{2}$; and of $\frac{2}{2}$, $\frac{3}{3}$, $\frac{4}{4}$ and 1.

Money
- Converts Rupee to Paise.
- Adds and subtracts amounts using column addition and subtraction with regrouping.
- Uses operations to find totals, change, multiple costs and unit cost.
- Estimates roughly the totals and total cost.

Measurement
- Relates metre with centimetre;
- Converts metre into centimetres and vice versa.
- Solves problems involving length and distances.
- Estimates length of an object and distance between two given locations.

Weight
- Weighs objects using a balance and standard units.
- Determines sums and differences of weights.
- Estimates the weight of an object and verifies using a balance.

Volume
- Measures volumes of given liquid using containers marked with standard units.
- Determines sums and differences of volumes.
- Estimates the volume of a liquid contained in a vessel and verifies by measuring.

Time
- Computes the number of weeks in a year.
- Correlates the number of days in a year with the number of days in each month.
- Justifies the reason for the need of a leap year.
- Reads clock time to the nearest hours and minutes.
- Expresses time, using the terms, ‘a.m.’ and ‘p.m.’
- Estimates the duration of familiar events.
- Finds approximate time elapsed by (to the nearest hour) forward counting.
- Computes the number of days between two dates.

Data Handling
- Collects data and represents in the form of bar graphs;
- Draws Inferences by discussing with the teacher.

Patterns
- Identifies patterns in multiplication and division: multiples of 9.
- Casts out nines from a given number to check if it is a multiple of nine.
- Multiplies and divides by 10s, 100s.
- Identifies geometrical patterns based on symmetry.
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EXERCISES

1. Write the numeral in the box which has:
   (a) 3 thousands, 4 hundreds and 5 ones.
   (b) 9 hundreds, 2 ones, 3 tens and 5 thousands.
   (c) 8 tens, 4 hundreds and 6 thousands.
   (d) 9 thousands, 2 tens and 1 one.

2. Use the digits given on the cards and form the largest and the smallest numbers of 4 digits.
   Largest ______________  Smallest ______________

3. In each group, split the number given in the triangle in three parts and fill the blank circles. First one is done for you.
4. Do as directed and fill the correct numbers in the boxes:

\[
\begin{array}{c}
745 \\
\text{Add 200} \\
\text{Subtract 75} \\
\text{Subtract 125}
\end{array}
\]

What do you get in the end? 
Do you know why?

5. A and B are the mid-points of the two given numbers. What numbers will you put in place of A and B?

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>2000</td>
</tr>
<tr>
<td>500</td>
<td>750</td>
</tr>
</tbody>
</table>

6. Round off to the nearest tens and find the actual and estimated sums of 126 and 311.

7. Round off to the nearest hundreds and find the actual and estimated differences of 5318 and 2935.

8. Look at the time in the clock and answer the following questions:

   (a) What time is it? ________
   (b) What time will it be after half an hour? ________
   (c) What time was it 1 hour and 15 minutes ago? ________

9. Write the fractions in the boxes shown in the following figures by the shaded portions.

10. Write the answers in the given placeholders.

   (a) 3 times 18 is
   (b) 5 times 20 is
   (c) 7 times 21 is
   (d) 6 times 25 is
   (e) 4 times 50 is
   (f) 3 times 100 is
11. Anil has ₹8445 in his bank account, while Sumit has ₹6330 in his account. How much more money does Anil have?

12. Veena bought 3 kg 275 g potatoes and 2 kg 25 g tomatoes. How much total vegetables did she buy?

13. A bottle has 1 L 200 mL medicine in it. If each one of 275 patients is given 1 mL medicine, how much medicine is left in the bottle?

14. A long plastic pipe measures 32 m 8 cm. Aruna cut off 15 m 25 cm and Varun cut off 3 m 18 cm pipe from it. How much pipe is left?

15. Draw a mirror line in each of the following figures if possible:

```
   L  M
```

16. Amy arranges 124 wooden blocks equally in 4 rows. Find the number of blocks she puts in a row.

17. A man earns ₹240 by working in a field for a day. How much money does he earn at the end of the month in which he works for 28 days?

18. Draw a pictograph of the chocolates sold by four persons in a day:

<table>
<thead>
<tr>
<th>Persons</th>
<th>Tina</th>
<th>Nina</th>
<th>Vivek</th>
<th>Rohit</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of chocolates</td>
<td>45</td>
<td>60</td>
<td>30</td>
<td>55</td>
</tr>
</tbody>
</table>

19. Fill in the blanks:
(a) The first month of the year is ________ .
(b) The minute hand takes ________ hour to complete a round.
(c) In a non-leap year, February has ________ Sundays.
(d) 180 minutes make ________ hours.

20. Ajay had 7 boxes of oranges containing 875 pieces. Supriya bought 4 boxes from him. How many pieces of oranges has Ajay now?

**CHALLENGE**

1. Give two multiples of 3 which add up to 39.
2. Give two multiples of 11 which add up to 77.
3. Write the smallest number of 4 digits with two different numerals.
In standard III, we have learnt that:

- The greatest (largest) 1-digit number is 9.
- The greatest (largest) 2-digit number is 99.
- The greatest (largest) 3-digit number is 999.
- The greatest (largest) 4-digit number is 9999.

We also obtained the smallest numbers by adding 1 to the greatest numbers as below:

- The smallest 1-digit number is 1.
- The smallest 2-digit number is 10 (i.e., 9 + 1).
- The smallest 3-digit number is 100 (i.e., 99 + 1).
- The smallest 4-digit number is 1000 (i.e., 999 + 1).
- The smallest 5-digit number is 10000 (i.e., 9999 + 1).

So, we see that 10000 is obtained by adding 1 to 9999. The number name for 10000 is “ten-thousand”.

The place value chart for 10000 is given below:

<table>
<thead>
<tr>
<th>T-Th</th>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**READING A FIVE DIGIT NUMBER**

<table>
<thead>
<tr>
<th>Numeral</th>
<th>Place Value Chart</th>
<th>Number Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>10006</td>
<td>T-Th 1 0 0 0 6</td>
<td>Ten thousand six</td>
</tr>
<tr>
<td>12957</td>
<td>T-Th 1 2 9 5 7</td>
<td>Twelve thousand nine hundred fifty seven</td>
</tr>
<tr>
<td>Number</td>
<td>T-Th</td>
<td>Th</td>
</tr>
<tr>
<td>----------</td>
<td>------</td>
<td>----</td>
</tr>
<tr>
<td>70598</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>90657</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>95000</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>99009</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>99999</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

70598 is the largest 5-digit number.

Let us see, what number shall we get by adding 1 to 99999.

\[
99999 + 1 = 90000 + 9000 + 900 + 90 + 9 + 1
\]

\[
= 90000 + 9000 + 900 + 90 + 10
\]

\[
= 90000 + 9000 + 900 + 100
\]

\[
= 90000 + 9000 + 1000
\]

\[
= 90000 + 10000
\]

\[
= 100000
\]

100000 stands for 100 thousands. Its number name is “one lakh”.

Thus one hundred thousands = one lakh.

100000 has six digits. It is one more than 99999.

100000 is the smallest 6-digit number.

The place value chart for 1 lakh is

<table>
<thead>
<tr>
<th>Lakh</th>
<th>Ten thousand</th>
<th>Thousand</th>
<th>Hundred</th>
<th>Ten</th>
<th>One</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**HOW TO WRITE LARGE NUMBERS**

To write large numbers, we can put a comma to separate digits.

First comma is put after 3-digits from right, then after every 2-digits from right.
Let us write some large numbers using comma.
59650 is written as 59,650.
90278 is written as 90,278.
129543 is written as 1,29,543.
500647 is written as 5,00,647.

**REPRESENTATION OF NUMBERS ON SPIKE ABACUS**

We have learnt the representation of 4-digit numbers on a spike abacus in standard III. 13205, a 5-digit number is represented on the spike abacus as shown here.

Now study the following examples:

**Example 1.** Write the number represented on each of the spike abacus.

![Spike abacus images](image)

(a) (b) (c)

**Solution.** (a) 31421 (b) 14036 (c) 23140

**Example 2.** Write the following numbers:

(a) 1 more than 100
(b) 1 more than 10000
(c) 1 more than 999
(d) 1 more than 6998

**Solution.** (a) 101 (b) 10001 (c) 1000 (d) 6999

**Example 3.** Write the next four numbers starting from:

(a) 42982 (b) 53902

**Solution.** (a) 42983, 42984, 42985, 42986
(b) 53899, 53900, 53901, 53902

**Example 4.** Counting by twos, write the numbers from 18726 to 18736.

**Solution.** The required numbers are:

18726, 18728, 18730, 18732, 18734, 18736.

**Example 5.** Counting by hundreds, write four numbers starting with 35308.

**Solution.** The numbers are: 35308, 35408, 35508, 35608.
EXERCISE 1.1

1. Write the numbers given on each of the following spike abacus:

\[\text{Th H T O} \quad \text{T-Th H T O} \quad \text{T-Th H T O}\]

(a) (b) (c)

2. Write the following numbers:

(a) 1 more than 10
(b) 1 more than 1200
(c) 1 more than 34500
(d) 1 more than 23499
(e) 1 more than 9999
(f) 1 more than 10000

3. For each of the following, write the next four numbers starting from:

(a) 78963
(b) 14609
(c) 25025
(d) 21235

4. Write all the numbers between:

(a) 18019 and 18025
(b) 27515 and 27518

5. Fill in the blanks by observing the pattern carefully:

(a) 44322, 44324, 44326, ........, ........, ........, ........
(b) 12315, 12320, 12325, ........, ........, ........, ........
(c) 98310, 98410, 98510, ........, ........, ........, ........
(d) 22429, 23429, 24429, ........, ........, ........, ........
(e) 97826, 97726, 97626, ........, ........, ........

6. Counting by fives, write the numbers from:

(a) 15515 to 15535
(b) 29331 to 29351

7. Counting by tens, write the numbers from:

(a) 32420 to 32450
(b) 99916 to 99946

8. Counting by hundreds, write five numbers starting from:

(a) 43410
(b) 35275

9. Counting by thousands, write four numbers starting from:

(a) 77524
(b) 96999

10. Write the smallest number of 5-digits.

11. Write the smallest number of 6-digits.

12. How many thousands are there in one lakh?
READING A 6-DIGIT NUMBER

<table>
<thead>
<tr>
<th>Numeral</th>
<th>Number Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,59,039</td>
<td>Two lakh fifty nine thousand thirty nine</td>
</tr>
<tr>
<td>6,50,000</td>
<td>Six lakh fifty thousand</td>
</tr>
<tr>
<td>9,23,187</td>
<td>Nine lakh twenty three thousand one hundred eighty seven</td>
</tr>
<tr>
<td>8,06,001</td>
<td>Eight lakh six thousand one</td>
</tr>
<tr>
<td>1,00,001</td>
<td>One lakh one</td>
</tr>
<tr>
<td>1,10,100</td>
<td>One lakh ten thousand one hundred</td>
</tr>
</tbody>
</table>

**EXERCISE 1.2**

1. Write the correct numeral in the table.

   (a) 5 ten-thousands 3 thousands 0 hundreds 5 tens 4 ones.

   (b) 4 ten-thousands 9 thousands 1 hundred 0 tens 9 ones.

   (c) 9 ten-thousands 0 thousands 0 hundreds 4 tens 3 ones.

2. Fill in the box with correct numeral:

   2489 = __ thousands __ hundreds __ tens __ ones.

   38206 = __ ten-thousands __ thousands __ hundreds __ tens __ ones.

   75794 = 7 ten-thousands 5 thousands __ hundreds __ tens __ ones.

   80413 = __ ten-thousands 0 thousands __ hundreds __ ten __ ones.

3. Write the number names for the following numbers:

   (a) 54792  (b) 80576  (c) 16509  (d) 99087

   (e) 60039  (f) 50005  (g) 29000  (h) 77070

4. Write the following numbers in figures:

   (a) Eight thousand nine hundred thirty six.

   (b) Seventy thousand five hundred ninety nine.

   (c) Ninety five thousand ninety five.
(d) Sixty thousand sixty.
(e) Fifty nine thousand nine hundred.
(f) Thirty seven thousand seven hundred eight.
(g) Ninety thousand.
(h) Twenty two thousand fifty eight.

**PLACE VALUE**

We have already learnt in previous classes that the place value of a digit depends on its position in the number. Here we shall extend the idea in respect of a number of 5-digits.

**Example 1.** Find the place value of each digit in 23405 in figures and words.

**Solution.**

<table>
<thead>
<tr>
<th>Number</th>
<th>Place value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In figures</td>
</tr>
<tr>
<td>2</td>
<td>5 ones</td>
</tr>
<tr>
<td>3</td>
<td>0 tens</td>
</tr>
<tr>
<td>4</td>
<td>4 hundreds</td>
</tr>
<tr>
<td>0</td>
<td>3 thousands</td>
</tr>
<tr>
<td>5</td>
<td>2 ten-thousands</td>
</tr>
</tbody>
</table>

**Example 2.** Find the place value of 7 and 9 in 67894.

**Solution.**

7 appears at the thousands place in 67894.  
∴ The place value of 7 is 7 thousands, i.e., 7000.

9 appears at the tens place in the given number.  
∴ The place value of 9 is 9 tens, i.e., 90.

**Example 3.** Find the sum of the place values of 3’s in the number 42303.

**Solution.** In 42303, the place value of:

- 3 in hundreds place is 300
- 3 in ones place is 3

∴ Sum of the place values = 300 + 3 = 303.
EXERCISE 1.3

Write the place value of:

1. 4 in 34521.
2. 8 in 83409.
3. 3 in 25394.
4. 7 in 12307.
5. 2 in 54092.
6. 0 in 40398.
7. 5’s in 35452.
8. 7’s in 72379.

9. Write the place value of two 4’s in 34541 in words.

10. Here is the meter reading of Kumar’s car. [56754]

Answer the following questions:

(a) When 1000 km more is travelled, which digit will change?
(b) To change the digit 7 to 8, how much more distance needs to be travelled?
(c) How many times is the 5 on the left greater than the 5 on the right?

11. Underline the correct place value of 7 in each number. The first one is done for you.

<table>
<thead>
<tr>
<th>Number</th>
<th>Place Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>27591</td>
<td>70</td>
</tr>
<tr>
<td>35719</td>
<td>70</td>
</tr>
<tr>
<td>75462</td>
<td>70</td>
</tr>
<tr>
<td>12471</td>
<td>70</td>
</tr>
<tr>
<td>63007</td>
<td>70</td>
</tr>
</tbody>
</table>

12. Write the place value of two 3’s in the number 23346. Is one value ten times the other?

13. Find the sum of the place values of the coloured digits:

(a) 5 6 9 5 2
(b) 3 4 4 2 4
(c) 7 6 7 4 7
(d) 6 3 6 0 6

14. Rewrite the following numbers by interchanging the digits at the thousands and ones places:

Example: 15603 → 13605.

(a) 18095
(b) 27531
(c) 80359
(d) 44300

15. Rewrite the following numbers by interchanging the digits at the tens and ten-thousands places:

(a) 74315
(b) 30549
(c) 76920
(d) 85076

EXPANDED FORM

We have already learnt the method of writing 4-digit numbers in the expanded form. Here we shall learn how to write 5-digit numbers in the expanded form.
Example 1. Write 5609 in the expanded form.

Solution. \( \therefore 5609 \) has 5 thousands, 6 hundreds, 0 tens, 9 ones
\[ \therefore 5609 = 5000 + 600 + 0 + 9 = 5000 + 600 + 9 \]

Example 2. Write 35619 in the expanded form.

Solution. 35619 has 3 ten-thousands, 5 thousands, 6 hundreds, 1 ten, 9 ones
\[ \therefore 35619 = 30000 + 5000 + 600 + 10 + 9 \]

Example 3. Write in short form:

(a) \( 7000 + 500 + 40 + 6 \)

Solution. (a) \( 7000 + 500 + 40 + 6 \)
\[ = 7 \text{ thousands}, 5 \text{ hundreds}, 4 \text{ tens}, 6 \text{ ones} = 7546. \]

(b) \( 40000 + 5000 + 30 + 2 \)
\[ = 4 \text{ ten-thousands}, 5 \text{ thousands}, 0 \text{ hundreds}, 3 \text{ tens}, 2 \text{ ones} \]
\[ = 45 \text{ thousands}, 0 \text{ hundreds}, 3 \text{ tens}, 2 \text{ ones} = 45032. \]

Example 4. How many hundreds are there in 6729?

Solution. 6729 = 6000 + 700 + 20 + 9
\[ = 60 \text{ hundreds} + 7 \text{ hundreds} + 2 \text{ tens} + 9 \text{ ones} \]
\[ = 67 \text{ hundreds} + 2 \text{ tens} + 9 \text{ ones} \]
\[ \therefore \text{There are 67 hundreds in 6729.} \]

**Exercise 1.4**

1. Write the following in the expanded form:
   (a) 5398  
   (b) 47508  
   (c) 99990  
   (d) 53083  
   (e) 40203  
   (f) 50678

2. Write the following in the short form:
   (a) 50000 + 6000 + 700 + 80 + 1  
   (b) 70000 + 8000 + 80 + 5  
   (c) 90000 + 4000 + 700 + 60  
   (d) 10000 + 800 + 20 + 3  
   (e) 20000 + 5000 + 20  
   (f) 40000 + 700 + 4  
   (g) 80000 + 60 + 3  
   (h) 3 ten-thousands, 4 thousands, 2 hundreds, 5 tens, 0 ones  
   (i) 47 thousands, 3 hundreds, 9 ones

3. Which one of the following is the expanded form of 58604?
   (a) 50000 + 8000 + 60 + 4  
   (b) 50000 + 8000 + 600 + 4  
   (c) 50000 + 800 + 60 + 4  
   (d) 50000 + 8000 + 600 + 40
4. Find the correct break up (expanded form) from the following for 77077:
   (a) 70000 + 7000 + 700 + 7
   (b) 70000 + 700 + 70 + 7
   (c) 70000 + 7000 + 700 + 70 + 7
   (d) 70000 + 7000 + 70 + 7

How many are:
5. hundreds in 3705? 6. thousands in 43981? 7. hundreds in 37509?
8. tens in 695? 9. tens in 3578?

ORDER RELATION
We have learnt the method of finding the greater of the two given 4-digit numbers. To compare 5-digit numbers, we follow the same rule.

We also know that:

Rule. A number containing more digits is greater than the number containing less digits.

For example, 15 > 7; 163 > 53; 3150 > 999

Example 1. Which is greater: 84321 or 9847?
Solution. The number 84321 has more digits than the number 9847.
∴ 84321 > 9847.
We also know that:

Rule. If two numbers contain the same number of digits, we compare them by their leftmost digits. If the leftmost digits are also the same, we compare them by their next digits to the right and so on.

Example 2. Which is smaller: 82361 or 98754?
Solution. 82361 has 8 ten-thousands.
98754 has 9 ten-thousands.
But we know that 8 ten-thousands are less than 9 ten-thousands.
∴ 82361 is smaller than 98754
or 82361 < 98754

Example 3. Which is greater: 62389 or 62754?
Solution. 62389 has 6 ten-thousands and 2 thousands.
62754 also has 6 ten-thousands and 2 thousands.
Since both the numbers have same digits at the ten-thousands and thousands places, so we compare the digits at the hundreds places.

62389 has the digit 3 at the hundreds place.

62754 has the digit 7 at the hundreds place.

Since 7 is greater than 3,

\[
\therefore 62754 \text{ is greater than } 62389 \quad \text{or} \quad 62754 > 62389.
\]

**ASCENDING-DESCENDING ORDER**

Ascending order means the increasing order. While writing the given group of numbers in the ascending order, we first write the smallest number and then the next greater number. Like this we keep on writing the next greater number and lastly, we write the greatest number.

Descending order means the decreasing order. While writing the given group of numbers in descending order, we first write the greatest number and then the next smaller number. Like this we keep on writing the next smaller number and lastly, we write the smallest number.

**Example 4.** Arrange the following numbers in ascending order:

15635, 15389, 28707, 2791, 489.

**Solution.** Here the smallest number is 489. The next number greater than 489 is 2791. The other numbers greater than 2791 in order are: 15389, 15635 and 28707.

\[
\therefore \text{The given numbers when arranged in ascending order are:}
489, 2791, 15389, 15635, 28707.
\]

**Example 5.** Arrange the following numbers in descending order using symbols:

5035, 42801, 1506, 27391, 41752.

**Solution.** Here the greatest number is 42801. The next number smaller than 42801 is 41752. The other numbers less than 41752 in order are: 27391, 5035 and 1506.

\[
\therefore \text{The given numbers when arranged in descending order are:}
42801 > 41752 > 27391 > 5035 > 1506.
\]
**FORMATION OF GREATEST AND SMALLEST NUMBERS**

We know how to form the greatest and the smallest number of 3 digits with the given digits. We adopt the same procedure in case of numbers of 4 or 5 digits. We explain the procedure below:

**Case 1. When the digits are not repeated.**

For the **greatest number of 4 digits**, write the greatest digit out of the given digits in the thousands place, the next smaller digit in the hundreds place, next smaller digit in the tens place and the smallest digit in the ones place.

For example, if the given digits are 3, 9, 0 and 5, then the greatest number of 4 digits is 9530.

For the **greatest number of 5 digits**, write the greatest digit in the ten-thousands place, next smaller digit in the thousands place and so on.

For example, if the given digits are 4, 6, 8, 0 and 2, then the greatest number of 5 digits is 86420.

For the **smallest number of 4 digits**, write the smallest digit out of the given digits in the thousands place, the next greater digit in the hundreds place, still greater digit in the tens place and the greatest digit in the ones place.

For example, if the given digits are 8, 2, 3 and 9, then the smallest number of 4 digits is 2389.

For the **smallest number of 5 digits**, write the smallest digit in the ten-thousands place, next greater digit in the thousands place and so on.

For example, if the given digits are 7, 5, 3, 1 and 2, then the smallest number of 5 digits is 12357.

*Note* When the given digits are 6, 2, 3, 0 and 4, then the smallest number of 5 digits is 20346.

02346 is actually 2346, which is a 4-digit number.

**Example 6.** Write the greatest and the smallest 4-digit numbers with the digits 3, 9, 2 and 5 (digits not to be repeated).

**Solution.** The greatest 4-digit number = 9532.

The smallest 4-digit number = 2359.

**Example 7.** Write the greatest and the smallest 5-digit numbers with the digits 5, 3, 7, 9 and 0 (digits not to be repeated).
Solution. The greatest 5-digit number = 97530.
The smallest 5-digit number = 30579.

Case 2. When the digits are repeated.

For the greatest 4-digit or 5-digit numbers, write the smallest digit at the ones place, write the next greater digit at the tens place and so on till all the digits are used. Repeat the greatest digit at the remaining places.

For example, if the given digits are 2, 1, 8, then the greatest number of 4 digits is 8821.

The greatest number of 5 digits is 88821.

For the smallest 4-digit or 5-digit numbers, write the greatest digit at the ones place, write the next smaller digit at the tens place and so on till all the digits are used. Repeat the smallest digit at the remaining places.

For example, if the given digits are 2, 7, 5, then the smallest 4-digit number is 2257.

The smallest 5-digit number is 22257.

Example 8. Write the greatest and the smallest 4-digit number, using all the digits 6, 1, 4.

Solution. The greatest 4-digit number = 6641.
The smallest 4-digit number = 1146.

Example 9. Write the greatest and the smallest 5-digit numbers by using all the digits 2, 0, 5, 6.

Solution. The greatest 5-digit number = 66520
The smallest 5-digit number = 20056

EXERCISE 1.5

Put > or < or = in the blanks to make the given sentences true:

1. 1531 ...... 907
2. 999 ...... 9990
3. 5410 ...... 4501
4. 89031 ...... 8891
5. 96345 ...... 70989
6. 19090 ...... 19909
7. 20312 ...... twenty thousand three hundred twelve.
8. 41316 ...... 40000 + 1000 + 300 + 10 + 6
9. 29302 ...... twenty nine thousand three hundred twenty.
10. Find the greatest and the least numbers in each group of numbers:
   (a) 25303, 25330, 23503, 23305
   (b) 90909, 90099, 99009, 99000
   (c) 27008, 27800, 27000, 27080
   (d) 41655, 41556, 41665, 41565

11. Rearrange the following numbers in ascending order:
   (a) 10800, 18100, 2056, 576, 5072
   (b) 5500, 50055, 8801, 995, 250
   (c) 3001, 432, 14032, 41231, 42103
   (d) 90909, 99009, 90099, 90009, 99000

12. Rearrange the following numbers in descending order:
   (a) 29712, 9787, 19503, 29811, 11111
   (b) 16306, 990, 1990, 21001, 25603
   (c) 11314, 17314, 73411, 70329, 45069
   (d) 6606, 66066, 60666, 66606, 66006

13. Say which of the following groups of numbers are arranged in descending or ascending order:
   (a) 2500, 25001, 29801, 92000, 92300
   (b) 1361, 13160, 21519, 25009, 29119
   (c) 27011, 27000, 26903, 17989, 11306, 1525
   (d) 25001, 24307, 20900, 18385, 10025, 9312

14. Write the greatest and smallest 4-digit numbers using all the digits from the following:
   (a) 8, 4, 6, 2
   (b) 3, 9, 1, 7
   (c) 7, 3, 0, 9
   (d) 2, 0, 6, 5

15. Write the greatest and smallest 5-digit numbers using all the digits from the following:
   (a) 5, 3, 1, 6, 9
   (b) 9, 2, 8, 3, 6
   (c) 7, 5, 9, 0, 3
   (d) 1, 5, 0, 8, 2

16. Write the greatest and smallest 4-digit numbers using all the digits (repetition allowed) from the following:
   (a) 2, 7, 4
   (b) 1, 5, 0
   (c) 3, 6

17. Write the greatest and the smallest 5-digit numbers using all the digits (repetition allowed) from the following:
   (a) 2, 7, 6, 8
   (b) 3, 0, 2, 4
   (c) 4, 0, 1

18. Change the positions of the digits, if necessary, to get the smallest 5-digit number.
   (a) 13985
   (b) 84457
   (c) 20356
   (d) 40308

19. Change the positions of the digits, if necessary, to get the greatest 5-digit number:
   (a) 71538
   (b) 53585
   (c) 95064
   (d) 80601

20. Write the greatest 4-digit number using:
   (a) only one digit
(b) all different digits
(c) all different digits but 3 in hundreds place.

21. Write the smallest 5-digit number using:
   (a) all different digits
   (b) 2 different digits
   (c) only two different digits with 3 in the ten-thousands place
   (d) 3 different digits with 6 in the tens place
   (e) 3 different digits with 4 in the thousands place and 1 in the tens place.

22. Write all possible 3-digit numbers using each of the digits 2, 8, 5 (only once) and then arrange them in ascending order.

23. Write all possible 3-digit numbers using each of the digits 3, 0, 2 (only once) and then arrange them in descending order.

**CHALLENGE**

Which has greater value:
(a) 43968 one-rupee coins or forty three thousand six hundred ninety-eight one-rupee notes?
(b) 86752 one-rupee notes or eight thousand six hundred seventy-five ten-rupee notes?

**ACTIVITY**

The teacher should divide the whole class into groups (say 4 groups) and if possible assign a name to each group, e.g., Shivaji, Laxmi Bai, Bhagat Singh, Maharana Pratap. Then he prepares 4 sets of digit cards (one set is shown here) and gives one set to each group. Let the sets of cards prepared by the teacher and given to groups is:
◆ 8, 3, 4, 2, 1 to Shivaji
◆ 7, 0, 3, 4, 9 to Laxmi Bai
◆ 6, 5, 3, 1, 4 to Bhagat Singh
◆ 9, 4, 5, 6, 0 to Maharana Pratap

Now let the children of each group write (without repetition of digits) as many 5-digit numbers as possible on a sheet of paper.

**Who is the Winner?**
The group that forms the maximum numbers in the shortest time.

**Note:** Another activity may be conducted where repetition of numbers is allowed.
Chapter Test

Time: 30 minutes

Note: Each question is of 2 marks.

1. Write the number names:
   (a) 53012
   _________________________________________________

   (b) 40067
   _________________________________________________

2. Arrange 20813, 20625, 19398, 27910, 1427 in ascending order:
   _________________________________________________

3. Write the greatest and smallest numbers of 5 digits with 4, 0, 3.
   Greatest number _____________________
   Smallest number ____________________

4. Write in figures:
   (a) Twenty thousand one hundred nine ____________
   (b) Seventy nine thousand fifteen ____________

5. Encircle the correct answer from the given options:
   (a) The correct break up for 60606 is
       (i) $6000 + 600 + 60$  (ii) $60000 + 600 + 6$
       (iii) $60000 + 6000 + 6$  (iv) $60000 + 600 + 60$

   (b) The number 14708 has
       (i) 47 hundreds  (ii) 47 thousands
       (iii) 147 hundreds  (iv) 147 tens
In class III, we have learnt the method of writing numbers up to ten thousand. We used ten numerals (symbols), i.e., 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 for writing these numbers. These numerals were first used by Hindus and then by Arabians. So these numerals are called **Hindu-Arabic numerals**. These numerals are now used all over the world and are thus called **international numerals**.

In India, people speak different regional languages and so use different regional numerals for writing numbers. For example, the numeral used for writing the number four in Hindi (Devnagri) is च and in Urdu it is written as .

**ROMAN NUMERALS**

Romans used other symbols for writing numbers. They used only seven basic symbols. They are I, V, X, L, C, D and M. Their respective values are given in the following table:

<table>
<thead>
<tr>
<th>I</th>
<th>V</th>
<th>X</th>
<th>L</th>
<th>C</th>
<th>D</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>10</td>
<td>50</td>
<td>100</td>
<td>500</td>
<td>1000</td>
</tr>
</tbody>
</table>

In this class, we shall learn the use of only first three symbols, i.e., I, V and X. With the help of these three symbols we can write numbers up to thirty nine. According to the convention, the compound symbols are formed by the rules given below:

(a) Repetition of I and X means addition, e.g.,

\[
\begin{align*}
II & = 1 + 1 = 2 \\
III & = 1 + 1 + 1 = 3 \\
XX & = 10 + 10 = 20 \\
XXX & = 10 + 10 + 10 = 30
\end{align*}
\]

**Note**

I and X can be repeated at the most three times. **V is never repeated.**

(b) If a smaller number is written to the right of a larger one, then smaller is added to the larger, e.g.,

\[
\begin{align*}
VI & = 5 + 1 = 6 \\
XII & = 10 + 1 + 1 = 12 \\
XV & = 10 + 5 = 15
\end{align*}
\]
(c) If I is written to the left of V or X, it is subtracted, e.g.,
IV = 5 – 1 = 4; IX = 10 – 1 = 9.

**Note**
V is never written to the left of X. I is written only once to the left of V and X.

(d) For numbers between 10 and 40, we first write the number in groups of tens and ones and then write the Roman numeral, e.g.,
22 = 10 + 10 + 2 = XXII; 39 = 10 + 10 + 10 + 9 = XXXIX.

**Example 1.** Write the Hindu-Arabic numerals for the following:
(a) IX (b) XVI (c) XIX
(d) XIV (e) XXXV (f) XXXVII

**Solution.**
(a) IX = 9  
(b) XVI = 10 + 6 = 16  
(c) XIX = 10 + 9 = 19  
(d) XIV = 10 + 4 = 14  
(e) XXXV = 30 + 5 = 35  
(f) XXXVII = 30 + 7 = 37

**Example 2.** Write the following in Roman numerals:
(a) 7 (b) 15  
(c) 28  
(d) 32  
(e) 21  
(f) 17  
(g) 23  
(h) 24

**Solution.**
(a) 7 = VII  
(b) 15 = 10 + 5 = XV  
(c) 28 = 10 + 10 + 8 = XXVIII  
(d) 32 = 10 + 10 + 10 + 2 = XXXII  
(e) 21 = 10 + 10 + 1 = XXI  
(f) 17 = 10 + 7 = XVII  
(g) 23 = 10 + 10 + 3 = XXIII  
(h) 24 = 10 + 10 + 4 = XXIV

**Example 3.** Correct the following by changing the place of one matchstick only:

(a) \[\begin{array}{c}
\text{X} \\
+ \\
\text{I} \\
\hline
\text{V} \\
\text{III}
\end{array}\]
(b) \[\begin{array}{c}
\text{V} \\
\text{V} \\
\text{I} \\
\text{I} \\
\hline
\text{I} \\
\text{I} \\
\text{I}
\end{array}\]
(c) \[\begin{array}{c}
\text{I} \\
\text{X} \\
+ \\
\text{I} \\
\text{V} \\
\hline
\text{X} \\
\text{V}
\end{array}\]

**Solution.**

(a) \[\begin{array}{c}
\text{X} \\
\text{I} \\
\text{I} \\
\hline
\text{V} \\
\text{III}
\end{array}\]
(b) \[\begin{array}{c}
\text{V} \\
\text{V} \\
\text{I} \\
\text{I} \\
\text{I} \\
\hline
\text{I} \\
\text{I} \\
\text{I}
\end{array}\]
(c) \[\begin{array}{c}
\text{I} \\
\text{X} \\
+ \\
\text{V} \\
\text{I} \\
\hline
\text{X} \\
\text{V}
\end{array}\]

**Note**
There may be more than one solution.
1. Write the Hindu-Arabic numerals for the following Roman numerals:
   (a) VII   (b) XII   (c) XXVII   (d) XXXVI
   (e) XXV   (f) XXXI   (g) XVIII   (h) XXIII

2. Fill in the boxes by using >, < or =, to make a correct sentence:
   (a) XIII   15
   (b) XIX   21
   (c) XXIV   19
   (d) XXIX   29
   (e) XXXV   23
   (f) XXXI   21

3. Read and match the time on the following watches:

4. Write the following in Roman numerals:
   (a) 2   (b) 11   (c) 13   (d) 26
   (e) 32   (f) 34   (g) 39   (h) 37

5. Which of the following are correct statements?
   (a) IXX = 19   (b) VX = 5   (c) XXIX = 29   (d) XXXIV = 34
   (e) XXIV = 24   (f) XII = 17   (g) VVV = 15   (h) II = 3
6. Join the correct numerals by arrows:
   (a) XXVI (A) 22
   (b) XXII (B) 34
   (c) XXXIV (C) 19
   (d) XIX (D) 26

7. Using two matchsticks, we can make the adjoining Roman numerals:
   (a) Make as many Roman numerals as possible by using
       (i) 3 matchsticks (ii) 5 matchsticks
   (b) How many matchsticks will be needed to write the following in Roman numerals?
       (i) 29 (ii) 33 (iii) 18 (iv) 36

**CHALLENGE**

Correct the following by changing the place of one matchstick only in each equation:

(a) \[XX + \| = X\|X\]
(b) \[X\|I + \|V = X\|V\|I\]
(c) \[\nI\|I\|I - \| = \|V\]
(d) \[XX\|I - \|V = XX\|V\|I\]

**ACTIVITY**

The teacher should give 10 matchsticks to each student and ask questions like:

1. Make a Roman numeral by using all of them.
2. Make a mathematical statement using all of them
   e.g., \[\| + \| = \|V\]

**Note**

1. If the teacher wishes, he may ask the students not to use sticks for the sign of + and – then make the statement e.g.,

   \[X + \|\|\| = X\|\|\|\]

2. Don’t expect the students to know beyond the number 39.
Chapter Test

Time: 30 minutes

Note: Each question is of 2 marks.

1. Write in Roman numerals:
   (a) 19 ______________________
   (b) 34 ______________________

2. Write in Hindu-Arabic numerals:
   (a) XXIX ______________________
   (b) XVI ______________________

3. Use > or < or = to make a correct statement:
   (a) XXII _______ XIV
   (b) XXXIX _______ 53

4. Correct and rewrite the given statements:
   (a) IXV = 16 ________________
   (b) XVX = 25 ________________

5. Encircle the correct answer from the given options:
   (a) The correct Roman numeral is
       (i) IIXV         (ii) XIIIV
       (iii) XXIV       (iv) IXIV
   (b) Using 4 matchsticks, the number of Roman numerals that can be made (up to 39) is
       (i) 4            (ii) 3
       (iii) 2          (iv) 5

Space for rough work