Secondary

MATHEMATICS

Class-VI

Publication Division

D.A.V. College Managing Committee

Chitra Gupta Road, New Delhi-110055

Contents

CHAPTER 1

NATURAL NUMBERS AND WHOLE NUMBERS

INTRODUCTION

Do you remember numbers? Let us solve some problems.

1. **Fill in the following blanks.**
   (a) The place value of 5 in 37572 is _____ .
   (b) 8 occurs at _____ place in 105876.
   (c) Place value of 4 in 42160 is _____ .
   (d) 5 occupies the _____ place in 37652.
   (e) The face value of 7 in 4709606 is _____ .
   (f) $3 \times 100000 + 5 \times 1000 + 7 \times 10 + 8 \times 1$ = _____ .
   (g) 200000 + 4000 + 800 + 6 = _____ .
2. **Find the product of the place value and face value of 5 in 76085432.**
3. **Find the product of the largest 4-digit number and the smallest 4-digit number. Write the product in expanded form also.**
4. **Write all the possible 3-digit numbers using the digits 7, 5, 1.**
   (Repetition not allowed)
5. **Write all the possible 3-digit numbers using the digits 4, 0, 6.**
   (Repetition not allowed)
6. **Write the following numbers in Indian System of Numeration.**
   (a) 8751432 (b) 60002 (c) 491603 (d) 632245687
7. **Write the following numbers in International System of Numeration.**
   (a) 5737802 (b) 411809 (c) 33246951 (d) 898576449
8. **Write the numerals for the following:**
   (a) Thirty two million four thousand three hundred and twenty nine.
   (b) Thirty nine crore forty eight lakh nine thousand and eighty eight.
9. **How many lakhs make 6 millions?**
10. **How many millions make 17 crores?**

ROMAN NUMERALS

Have you ever seen a clock of this type?

See! In place of numerals 1 to 12, symbols like I, II, III, IV are shown here.

These symbols are called **Roman Numerals.**

Now observe these Hindu Arabic Numerals and their corresponding Roman Numerals.

Hindu Arabic Numerals	I	5	10	50	100	500	1000
Roman Numerals	I	V	X	L	C	D	M

The rules for this system of numeration are given below:

- **Rule 1 –** If a symbol is repeated, its value is added as many times as it occurs.

  For example: II = 1 + 1 = 2

  XXX = 10 + 10 + 10 = 30

- **Rule 2 –** A symbol is not repeated more than three times but the symbols V, L and D are never repeated.

- **Rule 3 –** If a symbol of smaller value is written to the right of a symbol of greater value, its value gets added to the value of greater symbol.

  For example: VI = 5 + 1
  = 6
  LXV = 50 + 10 + 5
  = 65

- **Rule 4 –** If a symbol of smaller value is written to the left of a symbol of greater value, its value is subtracted from the symbol of the greater value.

  For example: IV = 5 – 1 = 4

  XL = 50 – 10 = 40

  XC = 100 – 10 = 90

- **Rule 5 –** The symbols V, L and D are never written to the left of a symbol of greater value, i.e. V, L, D are never subtracted.

Observe the Roman Numerals corresponding to some Hindu Arabic Numerals.

1 = I	10 = X
2 = II	20 = XX
3 = III	30 = XXX
4 = IV	40 = XL
5 = V	50 = L
6 = VI	60 = LX
7 = VII	70 = LXX
8 = VIII	80 = LXXX
9 = IX	90 = XC
10 = X	100 = C

Let us study some examples.

Example 1: Write the Roman Numerals corresponding to the following Hindu Arabic Numerals.

(a) 19 (b) 56 (c) 44 (d) 98 (e) 78

Solution:

(a) $19 = 10 + 9$
$= XIX$

(b) $56 = 50 + 6$
$= LVI$

(c) $44 = 40 + 4$
$= XLIV$

(d) $98 = 90 + 8$
$= XCVIII$

(e) $78 = 70 + 8$
$= (50 + 10 + 10) + 8$
$= LXXVIII$

Example 2: Convert the following into Hindu Arabic Numerals.

(a) LXXIX (b) XLIX (c) XCVII (d) XCI

Solution:

(a) $LXXIX = 50 + 10 + 10 + 9$
$= 79$

(b) $XLIX = 40 + 9$
$= 49$

(c) $XCVII = 90 + 7$
$= 97$

(d) $XCI = 90 + 1$
$= 91$

Worksheet 1

1. Write the Roman Numeral for each of the following:

(a) 33 (b) 500 (c) 48 (d) 76 (e) 95

(f) 41 (g) 87 (h) 66 (i) 19 (j) 1000

2. Convert the following into Hindu Arabic Numerals.

(a) XXVI (b) LXXVII (c) XCI (d) LXXXV (e) D

(f) XCIX (g) XCVII (h) LV (i) XLI (j) XXIX

3. Solve and write the results in Roman Numerals.

(a) 32 + 67 (b) 216 – 174

(c) 12 × 7 (d) 3645 ÷ 45

4. Which of the following is meaningless?

(a) VVII (b) XLI (c) LIV (d) IC (e) LIL

(f) IVC (g) XCI (h) VL

5. Match the following:

DXLV	908
MMX	591
CMVIII	545
CCIII	2010
DXCI	203

6. Write the following in Roman Numerals.

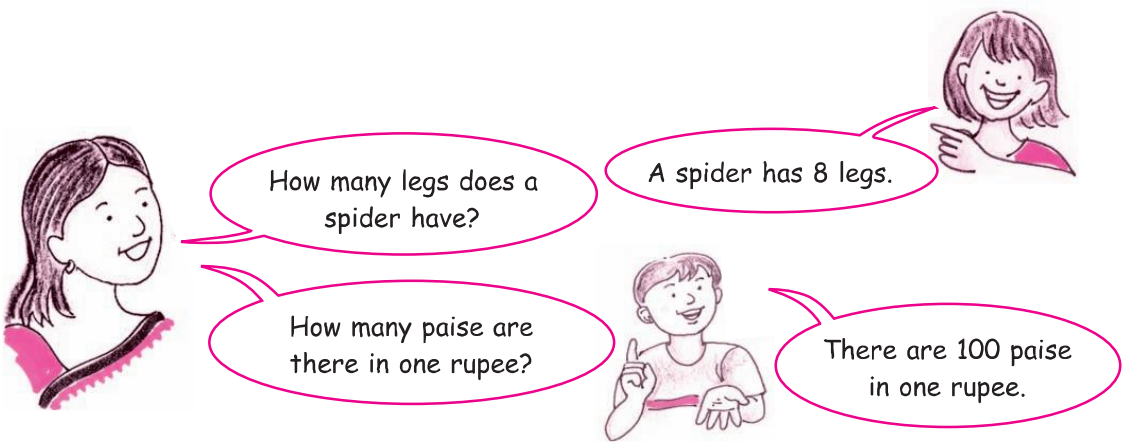
(a) Year in which India got Independence.

(b) Year in which India became Republic.

(c) Year in which you were born.

(d) Present year.

WHOLE NUMBERS AND THEIR REPRESENTATION ON NUMBER LINE



So we have used the numbers 1, 2, 3, 4, ... for answering these questions.

Numbers 1, 2, 3, 4, ... which we use for counting form the system of **Natural Numbers** (Counting numbers).

Remember

- The smallest natural number is 1.
- We cannot find the greatest natural number.

Look at the following picture. What is the number of boys in this group?

The number of boys in this group is zero (0).

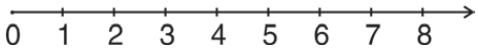
Natural numbers along with zero form the system of **Whole Numbers.**

Remember

- The smallest whole number is 0.
- We cannot find the greatest whole number.

For the teacher:
Explain to the students that these numbers are equidistant on the number line.

Now look at the whole numbers given on a number line.



SUCCESSOR AND PREDECESSOR

One more than any whole number is called the **successor** of that whole number.

For example: 51 is the successor of 50

10000 is the successor of 9999

Number to the Right

One less than any whole number is called the **predecessor** of that whole number.

For example: 61 is the predecessor of 62

99999 is the predecessor of 100000

Number to the Left

Let us take up some examples.

Example 3: Write the greatest 4-digit number using the digits 5, 0, 2. **(digits may repeat)**

Solution: Any 4-digit number occupies four places, i.e. thousands, hundreds, tens and ones. Since 5 is the largest number here, it will occupy most of the places in the required number and rest of the numbers will occur only once and that too in descending order. So, the required number will be,

Th	H	T	O
5	5	2	0

Example 4: Rearrange the digits of 72094186 to form the smallest 8-digit number.

Solution: We write the digits in ascending order–

0, 1, 2, 4, 6, 7, 8, 9

Since we cannot start a number with zero, we start the number with 1. So the required number is–

1, 02, 46, 789

Worksheet 2

1. **Complete the statements by filling in the blanks.**
   (a) The smallest whole number is _____.
   (b) There is _____ largest whole number.
   (c) In whole numbers, _____ has no predecessor.
   (d) The predecessor of the smallest 5-digit number has _____ digits.
   (e) The successor of the greatest 5-digit number is _____.
   (f) The smallest 7-digit number ending in 5 is _____.
   (g) 387 is to the _____ of 388 on the number line.
   (h) 4397 is to the _____ of 4396 on the number line.
2. **Write the successor of the following:**
   (a) 45638 (b) 10009 (c) 220209 (d) 4226372
3. **Write the predecessor of the following:**
   (a) 33801 (b) 100000 (c) 6698979 (d) 80115670
4. **Find the next three successors of 647999.**
5. **Find the three immediate predecessors of 552002.**
6. **Compare the following numbers:**
   (a) 729 ◯ 279 (b) 10899 ◯ 10799
   (c) 9785 ◯ 7835 (d) 135629 ◯ 136529
7. **Arrange the following in ascending order.**
   43, 287, 15769, 833, 49538, 34, 798665
8. **Arrange the following in descending order.**
   3951, 1024, 977, 422596, 38675, 560832, 67.
9. **Form the greatest 7-digit number using the digits 3, 8, 9.**
   (digits may repeat)
10. **Write the smallest 6-digit number using the digits 4, 5, 0.**
    (digits may repeat)