1

LARGE NUMBERS

WARM UP

Our Solar System

Our solar system is made up of 8 planets and our Sun. Jupiter is the largest planet and Mercury is the smallest planet in our solar system. Here, the diameters of all the planets are given. Study them carefully.

Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
4879 km	12104 km	12756 km	6779 km	142984 km	120536 km	51118 km	49528 km

1. Name four planets bigger than the Earth. Also write their diameters in words.

    Planet   **Diameter**

    a. _____   _____

    b. _____   _____

    c. _____   _____

    d. _____   _____

2. Find the following:

    a. The place value of 2 in

        i. 12104 _____   ii. 12756 _____   iii. 142984 _____   iv. 120536 _____

    b. The predecessor of

        i. 4879 _____   ii. 51118 _____   iii. 49528 _____   iv. 12756 _____

    c. Expanded form of

        i. 49528 _____   ii. 120536 _____

3. Diameters (in km) of some planets are given in words. Identify the planets.

    a. Twelve thousand one hundred four   _____

    b. One lakh forty-two thousand nine hundred eighty-four   _____

    c. One lakh twenty thousand five hundred thirty-six   _____

4. Name the three planets smaller than the Earth and round off their diameters to the nearest 10, 100 and 1000.

Planets	Diameters (in km)		
	Nearest 10	Nearest 100	Nearest 1000
a.			
b.			
c.			

KNOWING LARGE NUMBERS

7-Digit Numbers

We know that 999999 is the largest 6-digit number. If we add 1 to the largest 6-digit number, that is 999999, we get a 7-digit number.

```
    9 9 9 9 9 9  ---→ Largest 6-digit number
  +           1
  ─────────────
  1 0 0 0 0 0 0  ---→ Smallest 7-digit number
```

TIPS
For a 7-digit number, we need a new place, called ten lakh.

1000000 is the smallest number of seven digits and is read as ten lakh.
Similarly, 2000000 is read as twenty lakh, 3000000 is read as thirty lakh and 9000000 is read as ninety lakh.
The greatest number of seven digits is 9999999. It is read as ninety-nine lakh ninty-nine thousand nine hundred ninety-nine.
Some 7-digit numbers are given below. Let us see how these numbers are read.

S.No.	Numbers	How to read?
a.	2365480	Twenty-three lakh sixty-five thousand four hundred eighty
b.	5431008	Fifty-four lakh thirty-one thousand eight
c.	9318564	Ninety-three lakh eighteen thousand five hundred sixty-four
d.	8009683	Eighty lakh nine thousand six hundred eighty-three

8-Digit Numbers

When we add 1 to the greatest number of seven digits, that is 9999999, we get a 8-digit number.

```
    9 9 9 9 9 9 9  ----→ Largest 7-digit number
  +             1
  ───────────────
  1 0 0 0 0 0 0 0  ---→ Smallest 8-digit number
```

TIPS
For a 8-digit number, we need a new place called crore.

10000000 is the smallest number of eight digits.
It is read as one crore.
Similarly, 20000000 is read as two crore, 50000000 is read as five crore and 90000000 is read as nine crore.
The greatest 8-digit number is 99999999. It is read as Nine crore ninety-nine lakh ninety-nine thousand nine hundred ninety-nine.
Here are some 8-digit numbers. Read them about.

S.No.	Numbers	How to read?
a.	73030493	Seven crore thirty lakh thirty thousand four hundred ninety-three
b.	50000579	Five crore five hundred seventy-nine
c.	81134365	Eight crore eleven lakh thirty-four thousand three hundred sixty-five
d.	54326648	Five crore forty-three lakh twenty-six thousand six hundred forty-eight

PLACE VALUE CHART

There are two ways in which large numbers are read:
a. Indian place value chart
b. International place value chart

Each place value chart has some groups called periods and each period contains places. Let us study them.
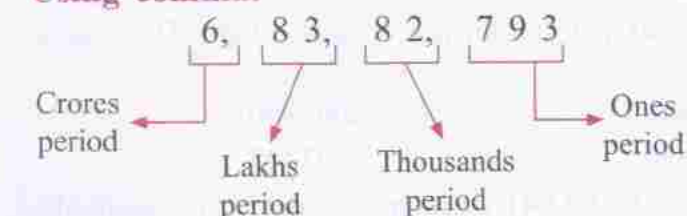
Indian Place Value Chart

In Indian place value chart, numbers are arranged into periods of Ones, Thousands, Lakhs, Crores and so on. Look at the following place value chart and observe the number 68382793 in it.

Periods	Crores		Lakhs		Thousands		Ones		
Places	Ten Crores (TC)	Crores (C)	Ten Lakhs (TL)	Lakhs (L)	Ten Thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
Value	100000000	10000000	1000000	100000	10000	1000	100	10	1
Number		6	8	3	8	2	7	9	3

In Indian place value chart, the name of the places in ones period are ones, tens, hundreds. Name of the places in thousands period are thousands, ten thousands. Name of places in lakhs period are lakhs, ten lakhs. Name of places in the crores period are crores, ten crores.
Now, we write and read the number shown in above place value chart.

Using comma:

6, 8 3, 8 2, 7 9 3

Crores period — Lakhs period — Thousands period — Ones period

TIPS
We put a comma (,) or leave some space to separate two periods.

Number name: Six crore eighty-three lakh eighty-two thousand seven hundred ninety-three.

TIPS
All the digits in the same period are read together and the name of the period except ones is read along with them.

Example 1. Arrange the following numbers in place value chart and write their number names according to Indian place value chart.

a. 69007572   b. 58123476   c. 98057412   d. 3500964

Solution: We arrange the given numbers in place value chart in the following way.

S.No.	Crores	Lakhs		Thousands		Ones			Number Names
	C	TL	L	TTh	Th	H	T	O	
a.	6	9	0	0	7	5	7	2	Six crore ninety lakh seven thousand five hundred seventy-two
b.	5	8	1	2	3	4	7	6	Five crore eighty-one lakh twenty-three thousand four hundred seventy-six
c.	9	8	0	5	7	4	1	2	Nine crore eighty lakh fifty-seven thousand four hundred twelve
d.		3	5	0	0	9	6	4	Thirty-five lakh nine hundred sixty-four

Example 2. Write the numbers in figures.

a. Nine crore thirty-six lakh forty-two thousand three hundred one

b. Six crore three lakh fifty thousand nineteen

Solution: Writing the digits in their respective places, we get

a.
C	TL	L	TTh	Th	H	T	O
9	3	6	4	2	3	0	1

b.
C	TL	L	TTh	Th	H	T	O
6	0	3	5	0	0	1	9

Using commas: 9,36,42,301

Using commas: 6,03,50,019

Exercise 1.1

1. Write the following numbers in Indian place value chart.
   a. 26,34,261   b. 6,73,26,431   c. 5,79,28,045   d. 80,56,248   e. 10,38,962

2. Write the numerals for the following.
   a. Eight lakh thirty-four thousand nine hundred forty-nine   _____
   b. Forty lakh seventy thousand six hundred ninety-eight   _____
   c. Five crore sixty-six lakh twenty-four thousand four hundred eleven   _____
   d. Eight crore seventy-three thousand sixteen   _____

3. Rewrite the following numbers with commas as per Indian place value chart. Then write these numbers in words.
   a. 6854470 _____   b. 89876560 _____   c. 60078005 _____
   d. 87654321 _____   e. 70052900 _____   f. 9993427 _____

4. As per 2011 census, the population of Delhi is 1,67,87,941. How many ones, tens, hundreds, thousands, ten thousands, lakhs and crores are there in 1,67,87,941?

FACE VALUE AND PLACE VALUE

Face Value

The face value of a digit in a number is the digit itself. The place at which the digit is present in the number does not matter.

Example 1. Find the face value of each digit in 5,36,42,089.

Solution: Face value of 5 = 5,   Face value of 3 = 3,
Face value of 6 = 6,   Face value of 4 = 4
Face value of 2 = 2,   Face value of 0 = 0
Face value of 8 = 8,   Face value of 9 = 9

C	TL	L	TTh	Th	H	T	O
5	3	6	4	2	0	8	9

Place Value

Place value of a digit depends on place of the digit in the number.

> Place value of a digit = Face value × Place of the digit occupies in the number

---

Example 2. Write the place value of each digit in the following:
a. 4,35,21,603   b. 70,50,106

Solution:

a.
C	TL	L	TTh	Th	H	T	O
4	3	5	2	1	6	0	3

$3 \times 1 = 3$
$0 \times 10 = 0$
$6 \times 100 = 600$
$1 \times 1000 = 1000$
$2 \times 10000 = 20000$
$5 \times 100000 = 500000$
$3 \times 1000000 = 3000000$
$4 \times 10000000 = 40000000$

b.
TL	L	TTh	Th	H	T	O
7	0	5	0	1	0	6

$6 \times 1 = 6$
$0 \times 10 = 0$
$1 \times 100 = 100$
$0 \times 1000 = 0$
$5 \times 10000 = 50000$
$0 \times 100000 = 0$
$7 \times 1000000 = 7000000$

Example 3. Find the sum and difference of the place values of coloured digits in 57290783.

Solution:

C	TL	L	TTh	Th	H	T	O
5	7	2	9	0	7	8	3

Place Value
700
7000000

Sum of place values = 7000000 + 700 = 70,00,700
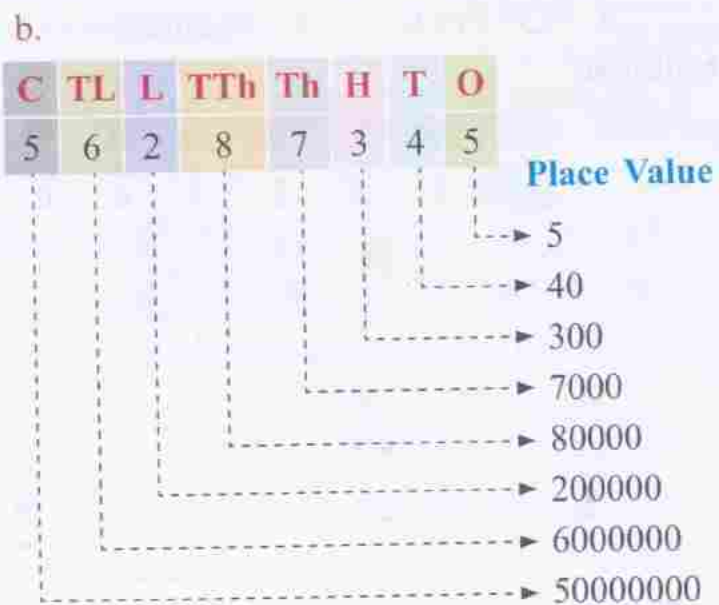Difference of place values = 7000000 − 700 = 69,99,300
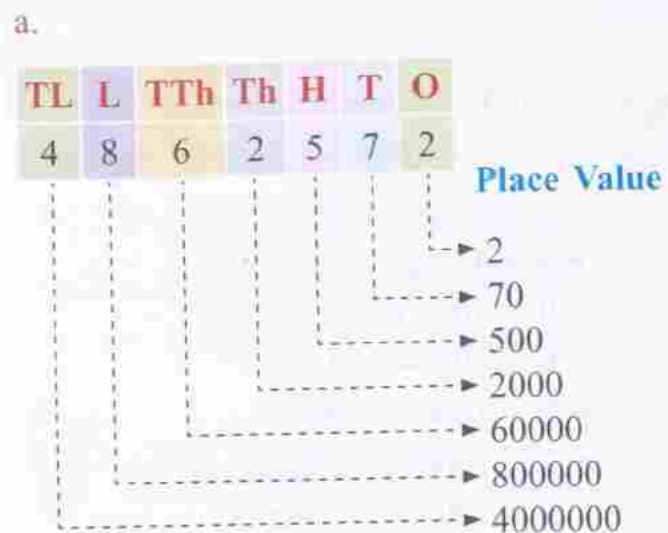
Expanded Form

The expanded form of a number is a way of expressing it as the sum of place values of all its digits.

Example 4. Expand the following numbers:
a. 4862572   b. 56287345

Solution:

a.

TL	L	TTh	Th	H	T	O
4	8	6	2	5	7	2

Place Value
- → 2
- → 70
- → 500
- → 2000
- → 60000
- → 800000
- → 4000000

b.

C	TL	L	TTh	Th	H	T	O
5	6	2	8	7	3	4	5

Place Value
- → 5
- → 40
- → 300
- → 7000
- → 80000
- → 200000
- → 6000000
- → 50000000

Expanded form of 48,62,572
= 4000000 + 800000 + 60000
  + 2000 + 500 + 70 + 2

Expanded form of 5,62,87,345
= 50000000 + 6000000 + 200000
  + 80000 + 7000 + 300 + 40 + 5

PREDECESSOR AND SUCCESSOR

The number that comes just before a given number is called its predecessor. We subtract 1 from the given number to get its predecessor.

Thus,   Predecessor = Number – 1

For example, the predecessor of 144 = 144 – 1 = 143

The number that comes just after a given number is called its successor. We add 1 to the given number to get its successor.

Thus,   Successor = Number + 1

For example, the successor of 144 = 144 + 1 = 145.

Example 1. Find the predecessor of the following:

    a. 2463687   b. 93643085

Solution:

    a. The predecessor of 2463687 = 2463687 – 1 = 2463686

    b. The predecessor of 93643085 = 93643085 – 1 = 93643084

Example 2. Find the successor of the following:

    a. 5364368   b. 70036499

Solution:

    a. The successor of 5364368 = 5364368 + 1 = 5364369

    b. The successor of 70036499 = 70036499 + 1 = 70036500

Example 3. Write the numerals for each of the following:

    a. 80000000 + 400000 + 3000 + 400 + 3

    b. 50000000 + 7000000 + 400000 + 20000 + 7000 + 70 + 3

Solution: Combining the place values of the digits, we get

    a. 80000000 + 400000 + 3000 + 400 + 3 = 80403403

    b. 50000000 + 7000000 + 400000 + 20000 + 7000 + 70 + 3 = 57427073

Exercise 1.2

1. Write the place value of the underlined digits in the given numbers:

    a. 196__5__417 _____   b. 82__4__596 _____

    c. 9004__2__003 _____   d. 7__3__96400 _____

    e. __9__8877723 _____   f. 53__6__48960 _____

2. Find the difference between the place values of '7' in 7642719.

3. What is the sum of the place values of '6' in 96458 and 611389?

4. Write the predecessor and successor of the following numbers:

    a. _____ 3684502 _____   b. _____ 8095200 _____

    c. _____ 27600541 _____   d. _____ 4598006 _____

    e. _____ 70908032 _____   f. _____ 5030200 _____

    g. _____ 40540320 _____   h. _____ 98732101 _____

5. Write the following numerals in the expanded form:

    a. 97856431 _____   b. 65678987 _____

    c. 76987656 _____   d. 67898769 _____

    e. 8625900 _____   f. 95600281 _____

6. Write the numerals for each of the following:

    a. 70000000 + 50000 + 6000 + 50 + 2 _____

    b. 80000000 + 70000 + 4000 + 500 + 5 _____

    c. 8000000 + 50000 + 9000 + 300 + 3 _____

    d. 6000000 + 900000 + 8000 + 70 + 2 _____

    e. 30000000 + 400000 + 5000 + 9 _____

COMPARING AND ORDERING NUMBERS

In order to compare two numbers, we adopt the following rules:

Rule 1. If two numbers have different number of digits, the number with less digits is smaller than the number with more digits.

Example 1. Compare 56436680 and 9656485.

Solution: Place both the numbers in place value chart.

Thus, 5,64,36,680 > 96,56,485

C	TL	L	TTh	Th	H	T	O	
5	6	4	3	6	6	8	0	→ 8 digits
	9	6	5	6	4	8	5	→ 7 digits

Rule 2. Suppose we have to compare two numbers with the same number of digits.

Step 1. First compare the digits at the left most place in both the numbers.

Step 2. If they are same, then compare the second digits from the left.

Step 3. If the second digits from the left are also same, compare the third digits from the left.

Step 4. Continue until you come across different digits at the corresponding places. Now, the number with greater such digit is the greater of the two.

Example 2. Which is greater—3527691 or 2954639?

Solution: 3527691 has 7 digits and 2954639 also has 7 digits.

We compare the leftmost digits of both numbers.

Since, 3 > 2 so, 35,27,691 > 29,54,639.

TL	L	TTh	Th	H	T	O
3	5	2	7	6	9	1
2	9	5	4	6	3	9

different

Example 3. Compare 8794365 and 8789973.

Solution: Both numbers are of 7 digits. So, first, we compare the leftmost digits of the two given numbers.

First leftmost digits are same. Second leftmost digits are also same.

Comparing third leftmost digits, we find that 9 > 8

So,   87,94,365 > 87,89,973

TL	L	TTh	Th	H	T	O
8	7	9	4	3	6	5
8	7	8	9	9	7	3

same different

Example 4. Arrange the following numbers in ascending order:

53072249, 51889620, 86121450, 27504545, 983250

Solution: Let us arrange the given numbers in the place value chart.

Here, we can see that there are four 8-digit numbers and one 6-digit number.

Clearly, the 6-digit number is the smallest.

In the 8-digit numbers,

27504545 < 51889620 < 53072249 < 86121450.

So, the numbers in ascending order are:

983250, 27504545, 51889620, 53072249, 86121450

C	TL	L	TTh	Th	H	T	O
5	3	0	7	2	2	4	9
5	1	8	8	9	6	2	0
8	6	1	2	1	4	5	0
2	7	5	0	4	5	4	5
		9	8	3	2	5	0

Example 5. Arrange the following numbers in descending order:

83672906, 74635618, 83910257,

9876879, 74613898

Solution: Let us arrange the given numbers in the place value chart.

Hence, the given numbers in descending order are:

83910257, 83672906, 74635618, 74613898, 9876879

C	TL	L	TTh	Th	H	T	O
8	3	6	7	2	9	0	6
7	4	6	3	5	6	1	8
8	3	9	1	0	2	5	7
		9	8	7	6	8	7	9
7	4	6	1	3	8	9	8

FORMING NUMBERS

Without Repetition of Digits

With the given digits many numbers can be formed. We know the method of forming the smallest and the greatest number using the given digits. Let us recall them.

To form the smallest number by given digits,

1. write the smallest digit other than zero (0) at the leftmost place.
2. then write zero (0) if given otherwise write other digits in their ascending order.

Example 1. Write the smallest number using the following digits:

   a. 9, 5, 3, 0, 1, 2   b. 7, 5, 6, 8, 3, 4

Solution: a. Smallest digit is 1 (other than 0).

So, the smallest number formed by the given digits is 102359.

b. Smallest digit is 3.

So, the smallest number formed by the given digits is 345678.

TIPS

0 on the leftmost place has no value.

To form the largest number by given digits,

1. write the greatest digit at the leftmost place.
2. then, write other digits in their descending order.

Example 2. Write the largest number using the following digits:

   a. 2, 5, 9, 6, 3, 8   b. 7, 0, 3, 5, 6, 4

Solution: a. Largest digit is 9.

So, the largest number formed by the given digits is 986532.

b. Largest digit is 7.

So, the largest number formed by the given digits is 765430.

With Repetition of Digits

To form the smallest number, we repeat the smallest digit.

Example 3. Form the smallest 8-digit number using the digits 3, 2, 1, 4, 5 and 0.

Solution: The smallest 8-digit number that can be formed using the given digits is 1,00,02,345.

To form the greatest number, we repeat the greatest digit.

Example 4. Form the greatest 7-digit number using the digits 5, 1, 4, 3 and 2.

Solution: The greatest 7-digit number that can be formed using the given digits is 55,54,321.

Exercise 1.3

1. Fill in the blanks using <, > or = .
   a. 905637 ☐ 807656   b. 1056953 ☐ 106075
   c. 7670757 ☐ 7670954   d. 34524017 ☐ 34324017
   e. 42003600 ☐ 42003600   f. 79000000 ☐ 79999999

2. Arrange the following numbers in ascending order:
   a. 863532, 8654627, 7825216, 7324545   b. 5231761, 2000413, 2050009, 2500496
   c. 6954521, 6954544, 6954530, 6954524   d. 7546542, 7546452, 7546321, 7546325
3. Arrange the following numbers in descending order.
   a. 87976, 76049, 75959, 97479   b. 528781, 452678, 453170, 654675
   c. 79836675, 79836785, 78935695, 94000456
   d. 98645421, 98645521, 98645321, 98645021
4. Find the smallest number formed by using digits 0, 3, 7, 6, 8, 5 only once. Also, find the greatest number.
5. Write the smallest and greatest number of 8 digits by using 3, 0, 1, 7, 5, 6, 9, 8 only once.
6. Write the greatest and smallest 7-digit numbers using the given digits. You may repeat the digits.
   a. 3, 7, 2, 4, 0   b. 8, 5, 9, 6   c. 4, 2, 7, 0   d. 5, 9, 3
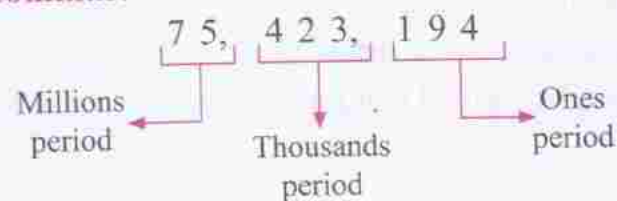
INTERNATIONAL PLACE VALUE CHART

In the International number system, every period has three places. Lets us take the number 75423194 and place it in International place value chart as shown below.

Periods	Millions			Thousands			Ones		
Places	Hundred Millions (HM)	Ten Millions (TM)	Millions (M)	Hundred Thousands (HTh)	Ten Thousands (TTh)	Thousands (Th)	Hundreds (H)	Tens (T)	Ones (O)
Value	100,000,000	10,000,000	1,000,000	100,000	10,000	1000	100	10	1
Number		7	5	4	2	3	1	9	4

In this place value chart, the name of the periods are Ones, Thousands and Millions. Name of places in ones period are ones, tens and hundreds. Name of places in thousands period are thousands, ten thousands and hundred thousands. Name of places in millions period are millions, ten millions and hundred millions.

Let us write and read the number shown in the above place value chart.

Using commas:

7 5, 4 2 3, 1 9 4

Millions period   Thousands period   Ones period

> **TIPS**
> We use commas after every third digit from the right to separate the periods.

In words: Seventy-five million four hundred twenty-three thousand one hundred ninety-four.

> **TIPS**
> We read the digits in the same period together and the name of the period except ones.

Example 1. Arrange the following numerals in the place value chart and write their number names according to International system.
   a. 56344219   b. 65732149   c. 78645231   d. 30032040

Solution: We arrange the numerals in place value chart in the following way.

S.No.	Millions		Thousands			Ones			Number name
	TM	M	HTh	TTh	Th	H	T	O	
a.	5	6	3	4	4	2	1	9	Fifty-six million three hundred forty-four thousand two hundred nineteen
b.	6	5	7	3	2	1	4	9	Sixty-five million seven hundred thirty-two thousand one hundred forty-nine
c.	7	8	6	4	5	2	3	1	Seventy-eight million six hundred forty-five thousand two hundred thirty-one
d.	3	0	0	3	2	0	4	0	Thirty million thirty-two thousand forty

Comparing Indian and International Place Value Charts

The place value upto ten thousands place are same in both the number systems. In Indian system, after ones period each period has two places. In International system each period has three places.

Remember the following comparison of both the systems.

1 million	=	10 hundred thousands
1 hundred thousand	=	10 ten thousands
1 ten thousand	=	10 thousands
1 thousand	=	10 hundreds
1 hundred	=	10 tens
1 ten	=	10 ones

Example 2. Write the following numbers using commas and in words in both the systems.
   a. 49378058   b. 50049861

Solution: Indian System
   a. **Using commas:** 4,93,78,058
      In words: Four crore ninety-three lakh seventy-eight thousand fifty-eight
   b. **Using commas:** 5,00,49,861
      In words: Five crore forty-nine thousand eight hundred sixty-one

International System
   a. **Using commas:** 49,378,058
      In words: Forty-nine million three hundred seventy-eight thousand fifty-eight
   b. **Using commas:** 50,049,861
      In words: Fifty million forty-nine thousand eight hundred sixty-one

Exercise 1.4

1. Write the numerals for:
   a. Seventy-five million twenty-eight thousand one hundred eight
   b. Ninety-two million two hundred forty-five thousand

c. Forty-nine million one hundred six thousand three hundred six   _____

d. Fifteen million ninety-three thousand four hundred five   _____

2. Rearrange the commas according to the International place value chart.

   a. 7,89,87,656 _____   b. 8,90,07,650 _____   c. 8,00,04,905 _____

   d. 75,40,565 _____   e. 9,54,93,207 _____   f. 3,48,96,705 _____

3. Write the number names according to the International place value chart in your notebook.

   a. 25,890,467   b. 43,865,890   c. 5,070,006

   d. 52,800,531   e. 6,100,782   f. 20,200,200

4. Fill in the blanks.

   a. _____ thousands = 1 million   b. _____ lakhs = 10 millions

   c. _____ millions = 1 crore   d. _____ thousands = 1 lakh

ROUNDING OFF NUMBERS

In the previous class, we learnt how to round off numbers to the nearest 10 and 100.

Let us recall and extend them. While rounding, we use the nearest multiple of 10, 100 or 1000.

Rounding Off to the Nearest 10

To round off a number to the nearest 10, follow these steps.

Step 1. Look at the ones digit of the given number.

Step 2. If ones digit is less than 5, replace ones digit by 0 and keep the other digits as they are.

Step 3. If ones digit is 5 or more, increase tens digit by 1 and replace ones digit by 0, keeping other digits as they are.

Examples: a. 91$\underline{3}$ → 910   b. 83$\underline{7}$ → 840   c. 475$\underline{5}$ → 4760

Rounding Off to the Nearest 100

To round off a number to the nearest 100, follow these steps.

Step 1. Look at the tens digit of the given number.

Step 2. If tens digit is less than 5, replace tens and ones digit by 0 and keep the other digits as they are.

Step 3. If tens digit is 5 or more, increase hundreds digit by 1 and replace tens and ones digit by 0, keeping other digits as they are.

Examples: a. 17$\underline{2}$9 → 1700   b. 55$\underline{8}$7 → 5600   c. 196$\underline{1}$4 → 19600

Rounding Off to the Nearest 1000

To round off a number to the nearest 1000, follow these steps.

Step 1. Look at the hundreds digit of the given number.

Step 2. If hundreds digit is less than 5, replace hundreds, tens and ones digits by 0 and keep the other digits as they are.

Step 3. If hundreds digit is 5 or more, increase thousands digit by 1 and replace each digit on its right by 0.

Examples: a. 8$\underline{3}$75 → 8000   b. 20$\underline{6}$84 → 21000   c. 22$\underline{5}$40 → 23000

Example 1. Round off each of the following numbers to the nearest 10.

   a. 684659   b. 1268573

Solution: a. In 684659, the digit at ones place is 9, which is greater than 5. So, we increase the digit at tens place by 1.

       Thus, 684659 becomes 684660.

       b. In 1268573, the digit at ones place is 3, which is less than 5.

       Thus, 1268573 becomes 1268570.

Example 2. Round off each of the following numbers to the nearest 100.

   a. 1849357   b. 32674938

Solution: a. In 1849357, the digit at tens place is 5. So, we increase the hundreds digit by 1.

       Thus, 1849357 becomes 1849400.

       b. In 32674938, the digit at tens place is 3, which is less than 5.

       Thus, 32674938 becomes 32674900.

Example 3. Round off 34856735 to the nearest:

   a. 100   b. 1000

Solution: a. In 34856735, the digit at tens place is 3, which is less than 5.

       Thus, 34856735 becomes 34856700

       b. In 34856735, the digit at hundreds place is 7, which is greater than 5.

       Thus, 34856735 becomes 34857000.

Exercise 1.5

1. Round off each of the following numbers to the nearest 10.

   a. 85 _____   b. 347 _____   c. 965 _____   d. 3242 _____

   e. 5052 _____   f. 9873 _____   g. 78744 _____   h. 408379 _____

2. Round off each of the following numbers to the nearest 100.

   a. 314 _____   b. 484 _____   c. 4650 _____   d. 9899 _____

   e. 17209 _____   f. 28769 _____   g. 120111 _____   h. 318574 _____

3. Round off each of the following numbers to the nearest 1000.

   a. 8373 _____   b. 9720 _____   c. 207898 _____   d. 26509 _____

   e. 318942 _____   f. 98975 _____   g. 1035609 _____   h. 2867366 _____

4. Round off each of the following numbers to the nearest: i. 10, ii. 100, iii. 1000.

   a. 12670 _____   b. 17645 _____   c. 15893 _____   d. 31982 _____

   e. 347125 _____   f. 158356 _____   g. 562780 _____   h. 1670248 _____

ROMAN NUMERALS

We learnt some Roman numerals in the previous class. Recall the rules of writing Roman numerals and use it to write greater numbers. Romans used seven basic symbols/letters to represent numbers. These symbols and their corresponding Hindu-Arabic numerals are given below.

Roman Numeral	I	V	X	L	C	D	M
Hindu-Arabic Numeral	1	5	10	50	100	500	1000

Rules for Writing Roman Numerals

Rule 1. Repetition of a Roman numeral means addition.

Examples: a. XII $= 10 + 1 + 1 = 12$ b. CXX $= 100 + 10 + 10 = 120$
c. MCCX $= 1000 + 100 + 100 + 10 = 1210$

Rule 2. A smaller numeral on the right side of a larger numeral is added to it.

Examples: a. XIII $= 10 + 1 + 1 + 1 = 13$
b. XXV $= 10 + 10 + 5 = 25$
c. DLX $= 500 + 50 + 10 = 560$

Rule 3. A smaller numeral on the left side of a larger numeral is subtracted from it.

Examples: a. IX $= 10 - 1 = 9$
b. CD $= 500 - 100 = 400$
c. DXCIV $= 500 + (100 - 10) + (5 - 1)$
$= 500 + 90 + 4 = 594$

Rule 4. There is no symbol for zero in the Roman number system.

> **Remember**
> - I, X, C and M can be repeated only thrice.
> - V, L and D cannot be repeated.
> - I can be subtracted only from V and X.
> - X can be subtracted only from L and C.
> - C can be subtracted only from D and M.
> - V, L and D are never subtracted.

Exercise 1.6

1. Write the Roman numerals for the following.
   a. 228 = _____ b. 418 = _____ c. 792 = _____
   d. 1090 = _____ e. 885 = _____ f. 2600 = _____

2. Convert into Hindu-Arabic numerals.
   a. XXV = _____ b. LXXIII = _____ c. DV = _____
   d. MIX = _____ e. CLXV = _____ f. MXXXIV = _____

3. Use >, < or = to compare the following:
   a. CDIV ☐ 406   b. CCCXC ☐ 380
   c. CMXC ☐ 990   d. CDVIII ☐ 208
   e. CCCLXXXVI ☐ 386   f. CLXV ☐ 168

4. Which of the following is meaningless?
   a. CCI   b. XLVV   c. DD   d. ILIX
   e. XDVI   f. VLIII   g. CXL   h. CCXXV

5. Given below are some important events in the life of Mahatma Gandhi—father of our nation. Rewrite the year of events in Roman numerals.
   a. Born in Porbundar, Gujarat – 1869 _____
   b. Married Kasturba – 1883 _____
   c. Started the boycott of British goods and non-cooperation movement – 1920 _____
   d. Lead the Salt March in Dandi – 1930 _____
   e. Launched the Quit India Movement – 1942 _____
   f. Kasturba died – 1944 _____
   g. Gandhiji was assassinated in Delhi – 1948 _____
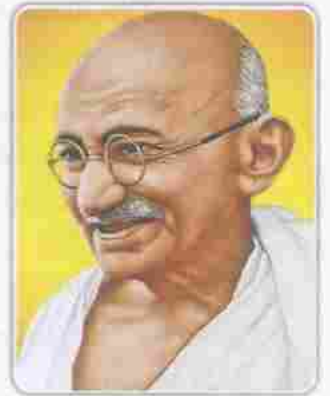
Points to Remember

- ❖ Ones, thousands, lakhs and crores are periods of the Indian place value chart.
- ❖ Ones, thousands and millions are periods of the International place value chart.
- ❖ The face value of a digit in a number is the value of the digit itself irrespective of its place in the number.
- ❖ The place value of a digit depends on its position in the number.
- ❖ The greater the number of digits, the greater is the number.
- ❖ If the number of digits is same, then we start the comparison of the digits from the left.
- ❖ The successor of a number is 1 more than the number.
- ❖ The predecessor of a number is 1 less than the number.
- ❖ To round off a number to the nearest tens, look at the digit in the ones place.
- ❖ To round off a number to the nearest hundreds, look at the digit in the tens place.
- ❖ To round off a number to the nearest thousands, look at the digit in the hundreds place.
- ❖ There are seven symbols in the Roman number system— I, V, X, L, C, D and M.

LEARNING UPDATES

1. Fill in the blanks.
   a. 100 million = _____ crores.   b. 1 million = _____ lakhs.
   c. 1 crore = _____ millions.   d. There are _____ zeroes in 60 millions.
   e. There are _____ zeroes in 9 crores.
   f. When 1 is added to a given number, we get the _____ of the number.

g. When 1 is subtracted from a given number, we get the _____ of that number.

h. The place value of _____ is always the same as its face value.

i. The Indian and the International systems of numerations follow the same pattern up to the _____ places.

2. State whether the following statements are true or false.
   a. The place value of 7 in 756361 is 7 lakh. _____
   b. The place value of 8 in 87059326 is 8 crore. _____
   c. There are 2 places in the millions period. _____
   d. There are 3 places in the lakhs period. _____

3. Write the following numbers in words in Indian system of numeration in your notebook:
   a. 8370794   b. 757325   c. 87295362
   d. 20202020   e. 8999773   f. 80195276

4. Write the following numbers in words in International system of numeration in your notebook:
   a. 846032   b. 8065249   c. 98306473
   d. 30303030   e. 75403567   f. 90286367

5. Write the following numbers in figures.
   a. Eight crore sixty-nine lakh thirty thousand seven hundred nineteen _____
   b. Five crore nineteen lakh nine thousand nine hundred ninety _____
   c. Four crore six lakh seven thousand one hundred four _____
   d. Eighty-four million one hundred nineteen thousand sixteen _____
   e. Eighty-nine million sixty-nine thousand forty-six _____
   f. Thirty million eight hundred five thousand one hundred six _____

6. Write the period, the place value and the face value of the coloured digits:
   a. 70186549   b. 84163570   c. 98370016

7. Fill in the boxes by >, < or =.
   a. 8448484 ☐ 848884   b. 9979779 ☐ 9979977
   c. 20202020 ☐ 20200202   d. 70997007 ☐ 70990707

8. Write these numbers in ascending order in your notebook.
   a. 63790568, 52790548, 62791023, 62790562, 62790931
   b. 7564890, 21350014, 998765, 998756, 23149925, 7546786

9. Write these numbers in descending order in your notebook.
   a. 2637928, 10199230, 20547946, 10061650, 15035810
   b. 12965783, 3076897, 29654503, 2789988, 21345603

10. Write the smallest and the greatest numbers using each of the following digits only once.
    a. 3, 7, 8, 4, 0, 6 _____   b. 8, 0, 5, 1, 3, 9, 6 _____

11. a. Write the smallest 7-digit number having all different digits. _____
    b. Write the greatest 7-digit number having all different digits. _____

12. a. Write the smallest 8-digit number having three different digits. _____
    b. Write the greatest 8-digit number having three different digits. _____

13. Round off the following numbers to the nearest 10, 100 and 1000.

S.No.	Number	Rounded off to 10	Rounded off to 100	Rounded off to 1000
a.	5833209			
b.	1609329			
c.	2895362			
d.	4012893			

Mental Maths

Tick (✓) the correct option.

1. Commas are inserted in a number after each
   a. digit ☐   b. place ☐   c. period ☐   d. group ☐

2. An 8-digit number starts with _____ place in the Indian system.
   a. lakhs ☐   b. ten thousands ☐
   c. ten lakhs ☐   d. crores ☐

3. An 8-digit number starts with _____ place in the International system.
   a. hundred thousands ☐   b. millions ☐
   c. ten millions ☐   d. crores ☐

4. The place value and face value of a digit are always equal at:
   a. ones place ☐   b. tens place ☐
   c. hundreds place ☐   d. None of these ☐

5. The number of zeroe in 100 million are:
   a. 7 ☐   b. 8 ☐   c. 9 ☐   d. 10 ☐

6. LXXX + LXX + LX + L =
   a. 180 ☐   b. 260 ☐   c. 320 ☐   d. 440 ☐

7. Which of the following is never repeated?
   a. M ☐   b. V ☐   c. C ☐   d. I ☐

8. Predecessor of MXLV is
   a. 126 ☐   b. 1026 ☐   c. 146 ☐   d. 1044 ☐

9. Successor of CDXXI is
   a. 388 ☐   b. 422 ☐   c. 420 ☐   d. 428 ☐

10. 80 lakh = _____ millions
    a. 8 ☐   b. 80 ☐   c. 800 ☐   d. 100 ☐

HOTS

Move only one matchstick in each of the following to make the statements true.

a. $X + V = IV$

b. $VII + V = III$

c. $XI - V = XI$

d. $III + VI = VII$

MATHS LAB ACTIVITY

Objective: To explore large numbers with an activity

Materials Required: Spinner with places, a deck of number cards (0-9), place value chart, a sheet of paper and a pencil

Steps

1. The class works in pairs. The teacher calls each pair one-by-one.
2. The first member of the pair picks up one number card and spins the spinner. He/she places the number card in the place value chart in the place where the spinner landed.
3. Now, it is the turn of the second player. He/she repeats the same method and place a number card in his place value chart.
4. Both the members of the pair from a 8-digit number in the same way and so they get two 8-digit numbers.
5. Say the numbers formed by both members are:
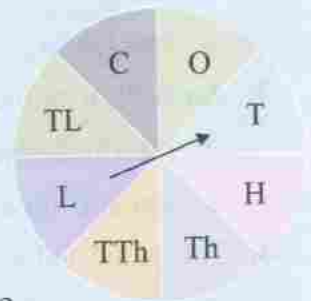
C	TL	L	TTh	Th	H	T	O	C	TL	L	TTh	Th	H	T	O
4	6	0	5	8	7	2	1	4	7	6	0	9	1	3	5

6. The members round off the numbers formed to the nearest 1000. Here, 46058721 is rounded to 46059000 and 47609135 is rounded to 47609000.
7. They find the predecessor and successor of the numbers formed. Here, the successor of 46058721 is 46058722 and that of 47609135 is 47609136. Similarly, the predecessor of 46058721 is 46058720 and that of 47609135 is 47609134.
8. Now, they compare the numbers formed by them. Here, 47609135 > 46058721. So, the second member is the winner.
9. They also compare the rounded numbers. Here, 47609000 > 46059000. Again the second member is the winner.