

# Large Numbers

## Learning Outcomes

At the end of this lesson, you will be able to:

- read and write numbers up to 8 digits in the Indian and international systems.
- write numbers in the expanded form.
- compare large numbers and arrange them in ascending/descending order.
- form greatest and smallest numbers from given digits.
- round numbers up to the nearest 10, 100 and 1000.
- write numbers 1–100 in the Roman number system.



## GET STARTED

### Large numbers in real life



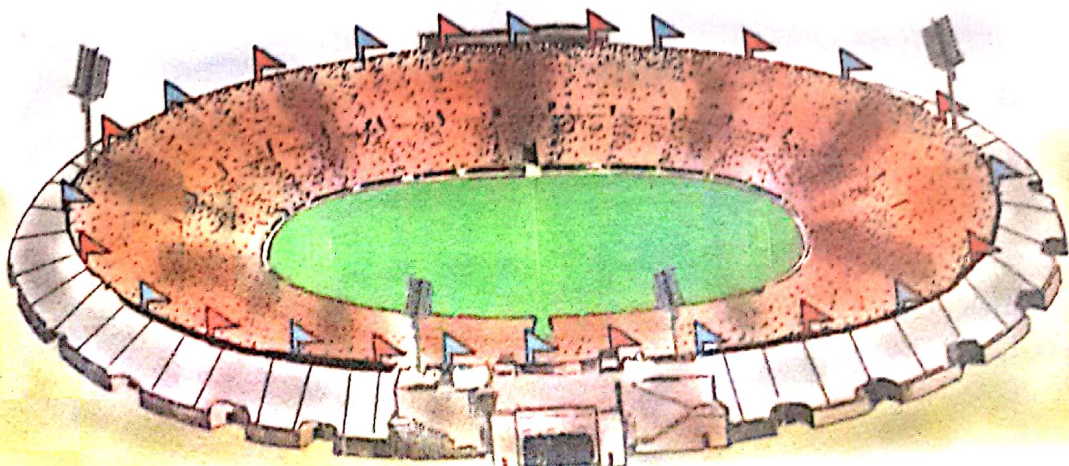
I watched a football match in a big stadium yesterday. It could seat 10,000 people!

You mean equal to the smallest 5-digit number! The Jawaharlal Nehru stadium in Delhi is much bigger. It can seat 60,000 people.



Is there a stadium in India that can seat the number of people equal to the smallest 6-digit number?

You mean 1,00,000? I am afraid not. The closest is Salt Lake Stadium in Kolkata that can seat 85,000 people!



## Check what you know

1. The greatest 6-digit number is: **9,99,999**.

It is read as: **nine lakh** ninety-nine thousand **nine hundred** ninety-nine

- a) Write the greatest 6-digit number in the place-value chart.

|          |                     |                         |           |                    |      |      |
|----------|---------------------|-------------------------|-----------|--------------------|------|------|
| period → | <b>Lakhs period</b> | <b>Thousands period</b> |           | <b>Ones period</b> |      |      |
| place →  | Lakhs               | Ten thousands           | Thousands | Hundreds           | Tens | Ones |
|          |                     |                         |           |                    |      |      |

- b) Write the expanded notation for the greatest 6-digit number:

$$9,99,999 = 9,00,000 + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

2. a) Arrange in ascending order: 4,67,453    77,453    74,753    4,67,360

- b) Arrange in descending order: 5,47,343    6,00,000    5,99,999    6,00,101

3. Use the digits 1, 4, 0, 9, 7, 2 to:

a) build the greatest 6-digit number and write its number name.

b) build the smallest 6-digit number and write its number name.

c) write the expanded form of both numbers.

4. a) Round 456 to the nearest:    i. 10    ii. 100    iii. 1000

- b) Write the Roman numeral for:    i. 9    ii. 39    iii. 26

## CONCEPTS SECTION

### ◆ 7-digit numbers

The population of city A on 15 April 2005, was 9,99,999.

1 child was born on 16 April 2005. What is the population of the city now?

To express the population now, we have to extend the number system beyond the greatest 6-digit number.

$$9,99,999 + 1 = 10,00,000$$

10,00,000 is the smallest **7-digit number**.

It is read as **10 lakh**.



$$\begin{array}{r} 9,99,999 \\ + \quad \quad 1 \\ \hline 10,00,000 \end{array}$$



10 lakh is written in the place-value chart as:

| Lakhs period |       | Thousands period |           | Ones period |      |      |
|--------------|-------|------------------|-----------|-------------|------|------|
| Ten lakhs    | Lakhs | Ten thousands    | Thousands | Hundreds    | Tens | Ones |
| 1            | 0     | 0                | 0         | 0           | 0    | 0    |

The new place value added is **ten lakhs**. It is in the lakhs period.

23,60,543 is a 7-digit number. It is read as:

**23,60,543**

Twenty-three lakh sixty thousand five hundred forty-three

It is written in the expanded form as:

$$20,00,000 + 3,00,000 + 60,000 + 500 + 40 + 3$$

**Example 1:** Write the number, with commas at the right places: Forty-six lakh six thousand five hundred one.

Forty-six lakh
six thousand
five hundred one

46, 06, 501



## EXERCISE 1

1. Write the number names and the expanded forms.

a) 23,89,009

b) 56,32,123

c) 40,00,304

2. Write the numbers and the expanded forms.

a) Fifty lakh sixty-six thousand nine hundred ten

b) Thirty-two lakh five thousand ninety-three

c) Seventy-eight lakh fifty-six thousand

3. Which is the greatest 7-digit number? Show it on a place-value chart.

## ◆ 8-digit numbers

The population of city A grew very fast. On 15 April 2015 it was 99,99,999.

1 more child was born on 16 April 2015. What is the population of the city now?

99,99,999 is the greatest 7-digit number. So to express the population now, we have to extend the number system beyond 7 digits.

$$99,99,999 + 1 = 1,00,00,000$$



1,00,00,000 is the smallest 8-digit number.  
It is read as 1 crore.

1 crore is written on the place value chart as:

| Crores period |           | Lakhs period |               | Thousands period |          | Ones period |      |
|---------------|-----------|--------------|---------------|------------------|----------|-------------|------|
| Crores        | Ten lakhs | Lakhs        | Ten thousands | Thousands        | Hundreds | Tens        | Ones |
| 1             | 0         | 0            | 0             | 0                | 0        | 0           | 0    |

To show 8-digit numbers, a new period called the **crores period** has been added.  
The new place value added is **crores**. It is in the crores period.

3,24,08,345 is an 8-digit number. It is read as:  
Three crore **twenty-four lakh** eight thousand three hundred to

It is written in the expanded form as:

$$3,00,00,000 + 20,00,000 + 4,00,000 + 8000 + 300 + 40 + 5$$

**EXERCISE 2**

- Write the number names and expanded forms.
  - 8,76,89,129
  - 6,74,20,098
  - 5,20,52,060
- Write the number and the expanded form.
  - Six crore fifty-five lakh sixty thousand eight hundred eight
  - One crore one lakh one hundred one
  - Five crore thirty lakh fifty-five thousand ninety-nine
- Which is the greatest 8-digit number? Show it on a place value chart.

◆ **Comparing numbers**

You have learnt to compare 6-digit numbers in Class 4. The same method is used to compare bigger numbers.



- The number with more digits is always greater.

Example 1:  $2,12,34,020 > 99,99,999$

(8-digit number) > (7-digit number)

2,12,34,020

99,99,999

- If the number of digits is the same, compare the leftmost digits first. If these are the same, compare the next digits on the right. Continue until you find two digits that are different.

Example 2: Compare 2,34,61,424 and 2,34,90,326

Both are 8-digit numbers.

Starting from the left, the first 3 digits are the same.

2, 3 4, 6 1, 4 2 4

Compare the fourth digit:  $6 < 9$

2, 3 4, 9 0, 3 2 6

Therefore,  $2,34,61,424 < 2,34,90,326$

### Before and after

You can get the number just before a large number by **subtracting 1** from it.

The number before 3,45,666 is  $3,45,666 - 1 = 3,45,665$

The number before 48,90,300 is  $48,90,300 - 1 = 48,90,299$



The number just before another number is called its predecessor.

You can get the number just after a large number by **adding 1** to it.

The number after 2,66,367 is  $2,66,367 + 1 = 2,66,368$

The number after 65,90,199 is  $65,90,199 + 1 = 65,90,200$

The number just after another number is called its successor.



### EXERCISE 3

1. Compare the numbers. Fill in the blanks with  $<$ ,  $>$  or  $=$ .

a)  $86,32,489$  \_\_\_\_  $1,32,00,123$

b)  $80,04,875$  \_\_\_\_  $80,40,578$

c)  $7,54,68,788$  \_\_\_\_  $7,54,86,788$

d)  $2,50,40,302$  \_\_\_\_  $2,50,40,203$

2. Write the number before.

a) 34,63,482

b) 1,23,45,010

c) 10,00,000

3. Write the number after.

a) 96,82,545

b) 1,29,39,999

c) 99,99,099

4. Arrange in ascending order.

a) 18,18,745

81,18,745

1,18,81,745

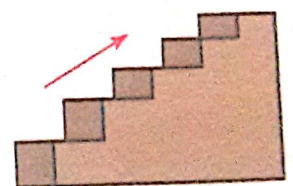
8,08,745

b) 1,22,22,622

22,26,222

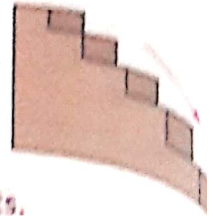
22,62,222

1,22,26,222



5. Arrange in descending order.

- a) 6,78,09,234      6,87,09,234      6,87,90,234      6,78,90,234  
 b) 1,32,48,131      2,32,45,234      1,32,58,214      2,33,98,789



6. Make the smallest and greatest 7-digit numbers, without repeating digits.

- a) 3, 4, 9, 1, 2, 5, 6      b) 5, 6, 7, 0, 4, 3, 2

7. Make the smallest and greatest 8-digit numbers, by repeating digits as required.

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

### ◆ International place-value system



Most countries of the world follow a place-value system that is slightly different from the Indian place-value system. It is called the **international place-value system**.

The numbers up to 5-digits are read in the same way in both systems.

The difference starts from 6-digit numbers.

Look at the table. Notice the difference in the periods (the places where commas are put to separate the periods) and in the names of places.

| Number   | No. of digits | Indian system           | International system           |
|----------|---------------|-------------------------|--------------------------------|
| 10000    | 5             | 10,000 – ten thousand   | 10,000 – ten thousand          |
| 100000   | 6             | 1,00,000 – one lakh     | 100,000 – one hundred thousand |
| 1000000  | 7             | 10,00,000 – ten lakh    | 1,000,000 – one million        |
| 10000000 | 8             | 1,00,00,000 – one crore | 10,000,000 – ten million       |

The Indian system uses lakhs and crores. The international system uses **millions**:

$$1 \text{ million} = 10 \text{ lakh, } 10 \text{ million} = 1 \text{ crore}$$

In the Indian system, the ones period has 3 places; the thousands, lakhs and crores periods have 2 places each.

In the international system the ones, the thousands and millions periods all have 3 places.

The place-value chart in the international system for numbers up to 8 digits is:

| Millions     |          | Thousands         |               |           | Ones     |      |      |
|--------------|----------|-------------------|---------------|-----------|----------|------|------|
| Ten millions | Millions | Hundred thousands | Ten thousands | Thousands | Hundreds | Tens | Ones |
| 5            | 6        | 3                 | 1             | 0         | 5        | 2    | 9    |

