# 1 Large Numbers

1. Write the following numbers in words.

   a) 9712 = _____

   b) 5942 = _____

   c) 6857 = _____

   d) 4569 = _____

2. Write the following number names in numerals.

   a) seven thousand two hundred seven = _____

   b) nine thousand five hundred two = _____

   c) six thousand seven hundred three = _____

   d) eight thousand nine hundred six = _____

3. Write the following numbers in expanded form.

   a) 6739 = _____ + _____ + _____ + _____

   b) 9268 = _____ + _____ + _____ + _____

   c) 8567 = _____ + _____ + _____ + _____

   d) 5912 = _____ + _____ + _____ + _____

# 4-digit numbers and above

A number that has four digits is a 4-digit number.

Example: 1234, 4567, 7890, 1935

A number that has five digits is a 5-digit number.

Example: 16379, 56541, 87490, 42338

Similarly, a number that has six digits is a 6-digit number.

A number that has seven digits is a 7-digit number.

**Largest 4-digit number**

| Th | H | T | O |
|----|---|---|---|
| 9  | 9 | 9 | 9 |

= nine thousand nine hundred ninety-nine

**Smallest 5-digit number = 9999 + 1 = 10000**

| TTh | Th | H | T | O |
|-----|----|---|---|---|
| 1   | 0  | 0 | 0 | 0 |

= ten thousand

**Largest 5-digit number**

| TTh | Th | H | T | O |
|-----|----|---|---|---|
| 9   | 9  | 9 | 9 | 9 |

= ninety-nine thousand nine hundred ninety-nine

**Smallest 6-digit number = 99999 + 1 = 100000**

| L | TTh | Th | H | T | O |
|---|-----|----|---|---|---|
| 1 | 0   | 0  | 0 | 0 | 0 |

= one lakh

**Largest 6-digit number**

| L | TTh | Th | H | T | O |
|---|-----|----|---|---|---|
| 9 | 9   | 9  | 9 | 9 | 9 |

= nine lakh ninety-nine thousand nine hundred ninety-nine

1. Express the smallest five-digit number in figures and words.
2. Express the largest seven-digit number in figures and words.
3. Express the smallest eight-digit number in figures and words.
4. Write the following numbers in words:

   a) 10,207        b) 98,237        c) 87,435        d) 2,47,890

   e) 4,70,357      f) 5,96,821      g) 9,75,431      h) 8,04,627

## Face value and place value

Face value: The value of a digit in any number is the face value of the digit.

   Example: Let us take the number 67890.

   ❖ The face value of 6 is 6 in the number 67890.
   ❖ The face value of 8 is 8 in the number 67890.

Place value: The place value of a digit depends upon the place it occupies in the number.

❖ If the digit is placed in the ones place, the place value will be the digit × 1.
❖ If the digit is placed in the tens place, the place value will be the digit × 10.
❖ If the digit is placed in the hundreds place, the place value will be the digit × 100.
❖ If the digit is placed in the thousands place, the place value will be the digit × 1000.

And so on.

So, we can say,

> Place value of any digit = Face value of the digit × place

Example: Find the place value of 7 in 8,97,624 by making a place value chart.

| L | TTh | Th | H | T | O |
|---|-----|-----|---|---|---|
| 8 | 9 | 7 | 6 | 2 | 4 |

We observe that 7 is placed in the thousands place.

Therefore, the place value of 7 = 7 × 1000 = 7000

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## Exercise 2

1. Write the face value and the place value of the digits in colour.

| S. No | Digit | Face value | Place value |
|-------|-------|------------|-------------|
| a) | 75391 | | |
| b) | 19762 | | |
| c) | 27833 | | |
| d) | 13286 | | |
| e) | 58923 | | |

2. Arrange the following numbers in the place value chart.

   a) 56, 021      b) 34, 123      c) 98, 909      d) 12, 110

3. Mark the periods by placing the commas and write the numbers in words.

   a) 56398  b) 23141      c) 918171      d) 75489      e) 392754

4. Answer the following questions for the number 953420.

   a) The place value of the digit 5 is _____.

   b) The place value of the digit 3 is _____.

   c) The digit whose place value is 50000 is _____.

5. Name the place value which comes after ten thousand.

## Writing numbers

Numbers can be written in three ways i.e., expanded form, word form, and standard form.

## Expanded form

Writing a number as the sum of the place values of its digits is called the expanded form.

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**Example:** Write the expanded form of the number 3,45,678.

**Step 1:** Make the place value chart.

| L | TTh | Th | H | T | O |
|---|-----|----|---|---|---|
| 3 | 4 | 5 | 6 | 7 | 8 |

From the place value chart we can write:

$$3,45,678 = 3 \times 100000 + 4 \times 10000 + 5 \times 1000 + 6 \times 100 + 7 \times 10 + 8 \times 1$$
$$= 300000 + 40000 + 5000 + 600 + 70 + 8$$

## Standard or short form

Standard form or short form is the normal way of writing a number.

**Example:** Write the following in short form.

$$7 \times 100000 + 9 \times 10000 + 3 \times 1000 + 6 \times 100 + 4 \times 10 + 1 \times 1$$
$$= 700000 + 90000 + 3000 + 600 + 40 + 1 = 793641$$

**Think and Answer**

For any 5-digit number, how many 0s will be there if the expanded form and the short form of the number is same.

**EXPERIENTIAL LEARNING**

**Life Skills**

Always remember the 8-digit landline number of your house.

### Exercise 3

1. Write the expanded form of the following numbers.
   a) 78098
   b) 421990
   c) 107092
   d) 8877341

2. Write the short form of the following.
   a) $4 \times 100000 + 4 \times 10000 + 4 \times 1000 + 4 \times 100 + 4 \times 10 + 4 \times 1 = $ _____
   b) $6 \times 100000 + 7 \times 10000 + 1 \times 1000 + 4 \times 100 + 9 \times 10 + 4 \times 1 = $ _____
   c) $3 \times 100000 + 0 \times 10000 + 1 \times 1000 + 7 \times 100 + 3 \times 10 + 7 \times 1 = $ _____
   d) $2 \times 100000 + 5 \times 10000 + 2 \times 1000 + 3 \times 100 + 2 \times 10 + 5 \times 1 = $ _____

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# Comparing numbers

**Example:** Compare the numbers 93456 and 7534.

The number with more digits is greater.

93456 ⟶ has 5 digits

7534 ⟶ has 4 digits

So 93456 > 7534.

**Example:** Compare the 6-digit numbers 789102 and 780201. Also form the largest number with the given digits.

789102 and 780201

❖ Both the numbers have the same number of digits.

❖ Work out the place value charts for both the numbers.

❖ Compare the digits from the left.

❖ Find the place where the digits are different, the number with the greater digit is the greater one.

| L | TTh | Th | H | T | O |
|---|-----|----|---|---|---|
| 7 | 8 | 9 | 1 | 0 | 2 |
| 7 | 8 | 0 | 2 | 0 | 1 |

❖ Start from the left.

❖ The digit in the lakhs place in both the numbers is 7 and same.

❖ The digit in the ten thousands place in both the numbers is 8 and same.

❖ The digits in the thousands place are unequal. They are 9 and 0.

Since 9 is greater than 0, so 789102 > 780201.

Largest number: Start with the largest digit and go to the smaller digit. We get the number 98642. So, 98642 is the largest number formed from the given digits.

## Think and Answer

In a 3-digit number, the second digit is four times as big as the third digit, while the first digit is three less than the second digit. What is the number?

## Maths Tip

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While forming a number from digits, one of which is 0, never start the number with 0.
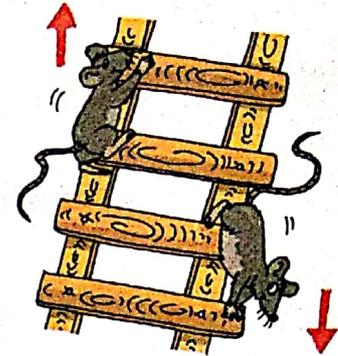
# Ordering numbers

## Ascending order

When we arrange the numbers from the smallest to the largest, it is called the **ascending order**.

Example: 1768, 29531, 38786, 55673 are in ascending order.

## Descending order

When we arrange the numbers from the largest to the smallest, it is called the **descending order**.

Example: 78935, 58673, 8975, 4831 are in descending order.

| Activity |
| --- |
| Write the year of birth of all your family members along with yours. Arrange these years in the ascending order. |

## Predecessor

Predecessor of any number is the number which comes just before the number.

Example: Predecessor of 843270 = 843270 − 1 = 843269

Therefore, predecessor = number − 1.

## Successor

Successor of any number is the number which comes just after the number.

Example: Successor of 678230 = 678230 + 1 = 678231

Therefore, successor = number + 1.

# Forming numbers

## Smallest and largest numbers

Let us form the smallest and the largest number using the digits 2, 9, 6, 4, 8.

### Smallest number

Start with the least digit and go to the larger digit. We get the number 24689. So, 24689 is the smallest number formed from the given digits.

**Largest number**

Start with the largest digit and go to the smaller digit. We get the number 98642. So, 98642 is the largest number formed from the given digit.

## Exercise 4

1. Write '<' or '>' in the boxes.

   a) 82765 ☐ 97450          b) 69475 ☐ 5824

   c) 9876 ☐ 9783            d) 45789 ☐ 59624

2. Arrange the numbers in ascending order.

   a) 2478, 2461, 2499, 2489, 2479, 2469    _____

   b) 3214, 1234, 4321, 1013, 1004, 0041    _____

3. Circle the largest number and tick (✓) the smallest number.

   a) 69534    73821    94786    67900
   b) 85396    69452    49875    12312
   c) 100901   001123   123978   900080

4. Arrange the numbers in descending order.

   a) 9876, 9867, 9786, 6798, 7689, 8769    _____

   b) 4456, 5793, 8832, 2311, 2752, 7558    _____

   c) 45678, 45089, 45009, 45110, 45900    _____

5. Write the predecessor and the successor of the following numbers.

| Predecessor | Number | Successor |
| --- | --- | --- |
| | 341098 | |
| | 908000 | |
| | 132341 | |

## Spot Check

1. Write '<' or '>' in the boxes.

   a) 1234 ☐ 5678

   b) 5923 ☐ 9874

2. Arrange the numbers in ascending order.

   1809, 1980, 1889, 1678, 1876, 1967 _____

3. Write the predecessor and the successor of the following numbers.

| Predecessor | Number | Successor |
|---|---|---|
| | 603089 | |

## Activity

EXPERIENTIAL LEARNING

1. Each student will take four dice of different colour.
2. The place value is assigned to each die.
3. Each die represents thousands, hundreds, tens and ones.
4. Each student will throw all the dice together.
5. Tell the students to form the number and write the numbers in words and figures.
6. Repeat this activity four times.
7. Write all the numbers in ascending and descending order.

| Numbers | | | | |
|---|---|---|---|---|
| Ascending order | | | | |
| Descending order | | | | |

# Rounding numbers

Pooja asked her friend Neha, 'How many rajma beans are there in the bowl?'
Neha replied 1178. Pooja said the rajma beans are about 1200.

We use rounding when we talk about how many. This means not exactly 1178 or not exactly 1200 but a number which is very close to the actual number.

❖ Rounding makes numbers that are easier to work with in your head.

❖ Rounded numbers are only approximate numbers.

❖ An exact answer generally can not be obtained using rounded numbers.

Use rounding to get an answer that is close but that need not be exact.

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# Rounding off

1. **Rounding off to the nearest 10**
   a) Underline the digit in the tens place.
   b) Check the digit placed in the ones place.
   c) If the digit in the ones place is 5 or more than 5, then the number is rounded off to next tens.
   d) If the digit in the ones place is less than 5, the digit in the tens place remains as it is but the digit in the ones place becomes 0.

**Example:** Round off the number 26724 to the nearest 10. Follow the above rules.
- Underline the digit in the tens place   ⟶ 267$\underline{2}$4
- Check the digit in the ones place   ⟶ 4
- The digit is less than 5. (4 < 5)
- So, the digit in the tens place remains same i.e., 2, but the digit in the ones place becomes 0. So 24 becomes 20.
- Hence, the rounded off number is   ⟶ 26720.

**Example:** Round off the number 972567 to the nearest 10. Follow the rules.
- Underline the digit in the tens place   ⟶ 9725$\underline{6}$7
- Check the digit in the ones place   ⟶ 7
- The digit is greater than 5. (7 > 5)
- So, 67 is round off the next ten   ⟶ 70
- Hence, the rounded off number is   ⟶ 972570

2. **Rounding off to the nearest 100**
   a) Underline the digit in the hundreds place.
   b) Check the digits to the right of the digit in the hundreds place.
   c) If it is 50 or more, the number is rounded off to the next hundred.
   d) If it is less than 50, the hundreds digit does not change but the digits in the tens and ones places become 0.

**Example:** Round off the number 3785345 to the nearest 100. Follow the rules.
- Underline the digit in the hundreds place   ⟶ 3785$\underline{3}$45
- The digits to the right of the digit in the hundreds place make 45. (45 < 50)
- So the digit in the hundreds place does not change. It remains 3, but the digits in the tens place and ones place become 0.
- Therefore, the number 3785345 is rounded off to 3785300.

**Example:** Round off the number 5678498 to the nearest 100.

   - ❖ The digit in the hundreds place is 4.
   - ❖ The digits to the right of 4 make 98. (98 > 50)
   - ❖ So 498 is rounded off to 500.
   - ❖ Therefore, the number 5678498 is round off to 5678500.

3. **Rounding off to the nearest 1000**
   a) Underline the digit in the thousands place.
   b) Check the digits to the right of the digit in the thousands place.
   c) If it is 500 or more, the number is rounded off to the next thousand.
   d) If it is less than 500, the digit in the thousands place does not change but the digits in the hundreds, tens, and ones places become 0.

**Example:** Round off the number 1234369 to the nearest 1000.

   - ❖ Digit in the thousands place is 4.
   - ❖ Digits to the right of 4 $\longrightarrow$ 369. (369 < 500)
   - ❖ The digit in the thousands place does not change. It remains 4 and all the digits to the right change to 0.
   - ❖ So, the number is rounded off to 1234000.

**Example:** Round off the number 1345786 to the nearest 1000.

   - ❖ Digit in the thousands place is 5.
   - ❖ Digits to the right side of 5 $\longrightarrow$ 786. (786 > 500)
   - ❖ Digit 5 becomes 6 and other digits to the right become 0.
   - ❖ The number 1345786 is rounded off to 1346000.

### Exercise 5

1. **Round off the following numbers to the nearest 10.**
   a) 2657   b) 4589      c) 23679      d) 14578      e) 53578

2. **Round off the following numbers to the nearest 100.**
   a) 3478   b) 2559      c) 18566      d) 23569      e) 89236

3. **Round off the following numbers to the nearest 1000.**
   a) 23678   b) 10945      c) 28196      d) 45238      e) 23567

# Indian and International system of numeration

We use the Indian place value system of numeration in India. Most other countries use International system of numeration. Both the systems — Indian and International — are based on the Indo-Arabic system of place values.

| Indian system of numeration | International system of numeration |
|---|---|
| ❖ The ones period has 3 places. | ❖ The ones period has 3 places. |
| ❖ Except ones period, all the periods have 2 places. | ❖ All periods have 3 places. |
| ❖ The places after thousands are called 'Lakhs', 'Crores' etc. | ❖ The places after thousands are called 'Millions', 'Billions' etc. |

## Indian place value chart

| Lakhs | | Thousands | | Ones | | |
|---|---|---|---|---|---|---|
| TL | L | TTh | Th | H | T | O |
| | 100000 | 10000 | 1000 | 100 | 10 | 1 |
| | 8 | 2 | 7 | 4 | 2 | 9 |

Number name: eight lakh twenty-seven thousand four hundred twenty-nine

Example: Write the number name for 459452.

❖ Mark periods first, then places
❖ Put ',' between periods
❖ No commas in the number name
❖ No 'and' in the number name

> **Maths Tip**
>
> Never use 's' with terms like hundred, thousand and lakh while writing a number name.

Number name: four lakh fifty-nine thousand four hundred fifty-two

## International place value chart

| Millions | | | Thousands | | | Ones | | |
|---|---|---|---|---|---|---|---|---|
| HM | TM | M | HTh | TTh | Th | H | T | O |
| | | | 100000 | 10000 | 1000 | 100 | 10 | 1 |
| | | | 8 | 2 | 7 | 4 | 2 | 9 |

Number name: eight hundred twenty-seven thousand four hundred twenty-nine

Example: Write the number name for 659452.

❖ Mark the periods and write short forms

* Place the digits from right to left
* Put commas between periods
* No 'and' in the number name

**Number name:** six hundred fifty-nine thousand four hundred fifty-two

## Exercise 6

1. Write the digits of the number in the Indian place value chart and write the number names.

   a) 230456      b) 329067      c) 745612      d) 382314

2. Write the digits of the number in the International place value chart and write the number names.

   a) 249231      b) 751084      c) 898742      d) 432329

3. Write in figures.

   a) seven lakh fourteen thousand one hundred thirty-two     _____
   b) three lakh seventy-five thousand nine hundred eight     _____
   c) five hundred twenty thousand two hundred twenty-one     _____
   d) four hundred thousand nineteen     _____
   e) four hundred thousand four hundred one     _____

## Roman numerals

The Romans developed symbols to write numbers from the letters of the alphabet. These symbols are known as **Roman numerals.**

Numeral is a script used for writing a number. It is the language of writing a number.

| Number | Numerals | |
|---|---|---|
| | Indo-Arabic | Roman |
| ●●● ●●● | 6 | VI |

The Romans used only seven numerals to represent a number.

| Roman numerals | I | V | X | L | C | D | M |
|---|---|---|---|---|---|---|---|
| Indo-Arabic numerals | 1 | 5 | 10 | 50 | 100 | 500 | 1000 |

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## Rules:

1. There is no symbol for '0'.
2. All numbers are formed by the combination of the above seven symbols.
3. I, X, C and M can be repeated thrice.

   Example: III = 3      XXX = 30

4. V, L and D are never repeated.
5. V is never written to the left of X.
6. A smaller symbol written on the left to the bigger symbol means we subtract the value of the symbol number from the bigger symbol.

   Example: IV = 5 – 1 = 4      IX = 10 – 1 = 9      XL = 50 – 10 = 40

7. A smaller symbol right to the bigger symbol means add the value of the smaller symbol to the value of the bigger.

   Example: VI = 5 + 1 = 6      XI = 10 + 1 = 11      LX = 50 + 10 = 60

8. I can be subtracted from V and X only once.
9. X can be subtracted from L, and C only once.

   Example:
   21 = XX + I               18 = X + VIII
   19 = X + IX               47 = XL + VII
   60 = L + X                96 = XC + VI
   400 = D – C              800 = D + CCC

**Project**                                     **EXPERIENTIAL LEARNING**

Use the Internet to find the history of Roman numbers.

## Exercise 7

1. Write the Indo-Arabic numerals for the following.

   a) XX     b) LX     c) CM     d) CD     e) XL

2. Write in Roman numerals.

   a) 70     b) 33     c) 25     d) 90     e) 80
   f) 65     g) 200     h) 600     i) 900     j) 700

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3. Write the sum in Roman numerals.

   a) C + XC       b) XXI + C       c) XX + VIII       d) M + D

4. Write the year 1990 in Roman numerals.

5. Write your date of birth in Roman numerals.

6. Write the number names for the following.

   a) 5678       b) 8947       c) 7245       d) 2478

7. Write the following numbers in figures.

   a) forty-two thousand four hundred forty-five    _____

   b) ninety thousand nine    _____

   c) three lakh thirty thousand thirty-three    _____

   d) two lakh twenty-four thousand one    _____

8. Write the numbers by interchanging the digits at thousands place and ones place.

   a) 34445       b) 12345       c) 67453       d) 67981

9. Arrange the numbers in a place value chart.

   a) 30709       b) 23008       c) 24344       d) 60002

10. Write the place value of the coloured digits.

    a) 66678       b) 87879       c) 20305       d) 76543

11. Write the sum of the place values of '4' in the following numbers.

    a) 24345       b) 56448       c) 43241       d) 123454

12. Write the difference of the place values of '5' in the numbers.

    a) 15645       b) 85354       c) 25345       d) 53452

13. Round off the numbers to the nearest tens.

    a) 5,678 _____       b) 2,304 _____

14. Round off the numbers to the nearest hundreds.

a) 56,389 _____     b) 89,123 _____

15. Round off the numbers to the nearest thousands.

a) 34,234 _____     b) 10,101 _____

16. Round off the numbers to the nearest ten thousands.

a) 67,809 _____     b) 14,441 _____

17. Write the predecessor and the successor of the following.

a) 478700     b) 567899

c) 645688     d) 759999

18. Express the number names for the following in the Indian and International system of numerations.

a) 572486     b) 790867

c) 298057     d) 86254

19. Match the following.

| a) two lakh twenty-five thousand four hundred five | i) 820002 |
| --- | --- |
| b) five lakh thirteen thousand three hundred | ii) 990001 |
| c) eight lakh twenty thousand two | iii) 110004 |
| d) seven lakh four thousand three | iv) 513300 |
| e) one lakh ten thousand four | v) 704003 |
| f) nine lakh ninety thousand one | vi) 225405 |

20. Write the Roman numerals.

a) 25     b) 67     c) 85     d) 41

Who am I?

* ❖ I am a 4-digit number.
* ❖ Thousands place is double the ones place.
* ❖ Tens place is one more than the hundreds place.
* ❖ Sum of all the digits is 13.

## Mental Maths

EXPERIENTIAL LEARNING

1. In each of the following, there is one incorrect number. Find the incorrect number and circle it.

    a) Count in tens: 1400, 1500, 1650, 1700, 1800

    b) Count in hundreds: 13457, 13557, 13657, 13477, 13857

    c) Count in thousands: 38902, 39802, 40902, 41902, 42902

    d) Count in ten thousands: 44444, 54444, 64444, 77777, 84444

2. Which digit in the number 98462 will you replace by the digit 7 to get a number greater than this number? Also, write the number.

3. Which digit is there in the hundreds place in the short form of the number 80000 + 7000 + 60 + 5?

4. Which will be greater? 5-digit smallest number or 4-digit greatest number

5. Write the successor of the number obtained when 196 is rounded to the nearest 10.

6. Write < or > on the blanks.

    a) XVI ............ XIV

    b) IV ............ VI

    c) CM ............ M

## Worksheet

Tick (✓) the correct option.

1. 70 lakhs = _____ millions.

   a) 70        b) 700        c) 0        d) 7

2. The greatest 5-digit number with all different digits is

   a) 98765        b) 56789        c) 99875        d) 90123

3. The place value of the digit 5 in 652,096 is

   a) thousands        b) ten thousands

   c) 5 thousands        d) 5 ten thousands

4. The difference between the largest 6-digit number and the smallest 6-digit number is

   a) 888888        b) 899999

   c) 900000        d) none of these

5. 75,959 rounded off to the nearest thousands gives

   a) 76,000        b) 75,000        c) 75,900        d) 70,000

6. The year 2021 in Roman numerals is

   a) MMCDVII        b) MMXVII        c) MCXVII        d) IIVII

7. 1 less than the smallest 6-digit number is

   a) 100001        b) 99999        c) 90000        d) 9999

8. The sum of the place values of the two 3s in 396347 is

   a) 303000        b) 300300        c) 300000        d) 330000

9. Five hundred seven million one hundred seventeen thousand one is written as

   a) 517,117,011        b) 507,117,001

   c) 507,117,100        d) 507,117,010

10. The number of zeroes in 10 lakh is _____.

    a) 4        b) 5        c) 6        d) 7