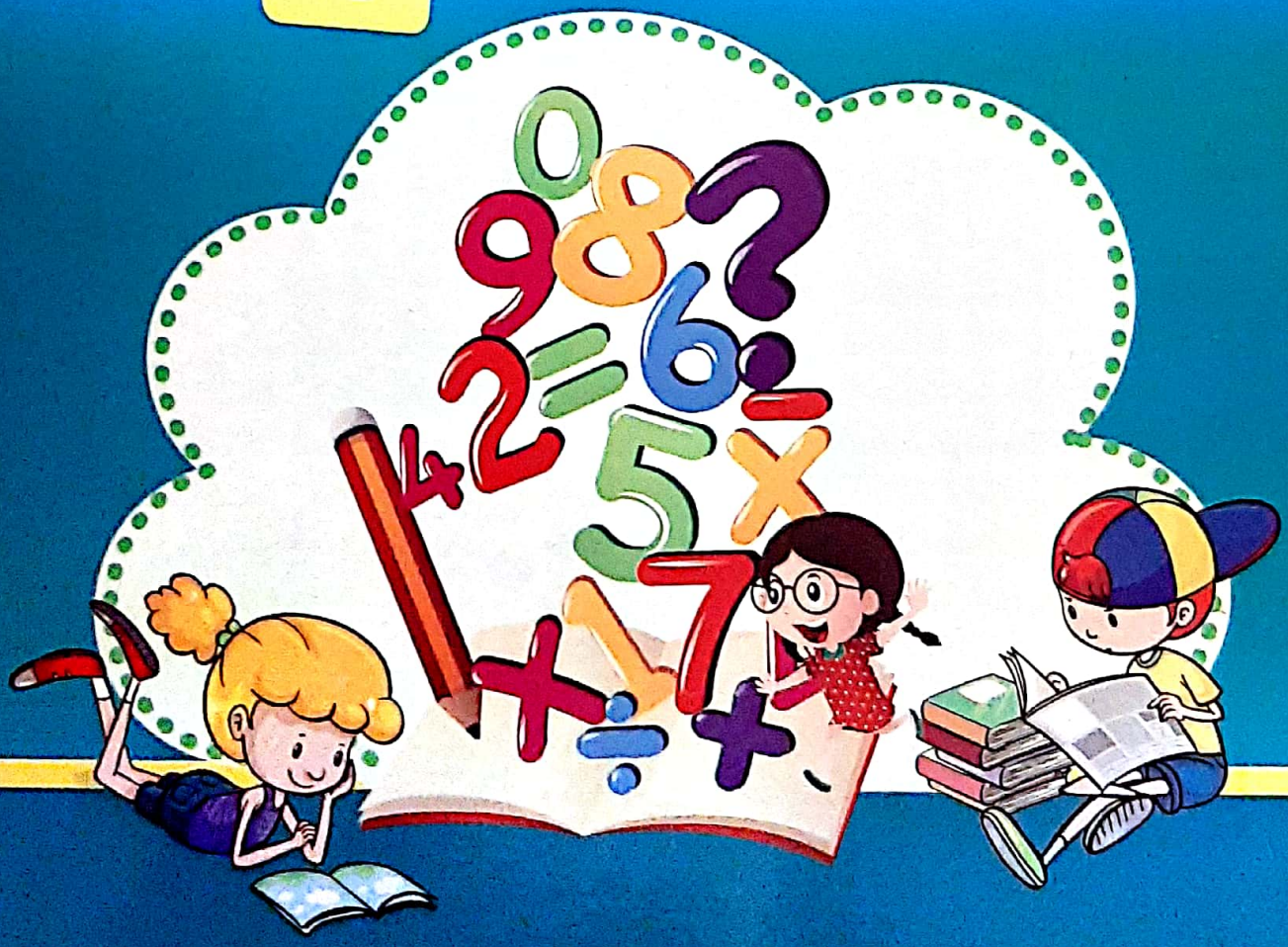
CORDOVA® App 24X7
For Teachers Only

FREE SMART CLASS SOFTWARE WITH WEB SUPPORT
FOR TEACHERS ONLY

STEP BY STEP
Mathematics

4



CORDOVA®

CONTENTS

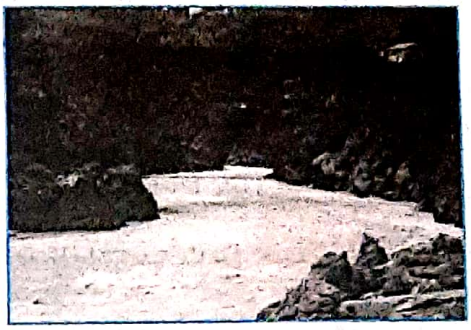
1 Numbers and Numeration

Use **Cordova Smart Class Software** on the **smart board** in class to learn about numbers and numeration.

Numbers are all around us.

Sachin Ramesh Tendulkar
Birth year - 1973

Mount Everest
Height- 8848 m



River Ganga
Length- 2525 km

We have already learnt numbers up to 9999 in Class III. Let us recall.

Exercise-1

Do you remember . . . . .

1. **Write in words :**
   (a) 3849 = ...
   (b) 5308 = ...
   (c) 8074 = ...
   (d) 7777 = ...
2. **Write in numeral form :**
   (a) Four thousand three hundred twenty .....
   (b) Seven thousand four hundred eighty-nine .....
   (c) One thousand nine hundred nine .....
   (d) Eight thousand seven hundred sixty-five .....

3. Write in expanded form :

(a) 6827 .....

(b) 3179 .....

(c) 8105 .....

(d) 4180 .....

4. Write in short form :

(a) 3000 + 400 + 50 + 6 = ...

(b) 7000 + 90 + 8 = ...

(c) 4000 + 200 + 20 = ...

(d) 6000 + 5 = ...

5. Fill in the blanks :

(a) The predecessor of 2000 is ..... .

(b) The successor of 3270 is ..... .

(c) The place value of 8 in 1278 is ..... .

(d) The place value of 7 in 7125 is ..... .

(e) The place value of 0 in 2058 is ..... .

6. Form the smallest and greatest 4-digit numbers using the digits 4, 0, 2 and 1 each only once.

Smallest number ☐ Greatest number ☐

7. Arrange in ascending order :

(a) 4217, 4315, 4035, 4479 .....

(b) 2893, 2983, 2398, 2978 .....

8. Arrange in descending order :

(a) 1728, 7128, 8127, 2718 .....

(b) 9256, 9526, 9652, 9729 .....

9. Use correct sign > , < or = :

(a) 1002 ☐ 1020 (b) 3540 ☐ 3450

(c) 8357 ☐ 8357 (d) 6825 ☐ 6827

Numbers Beyond 9999

5-Digit Numbers

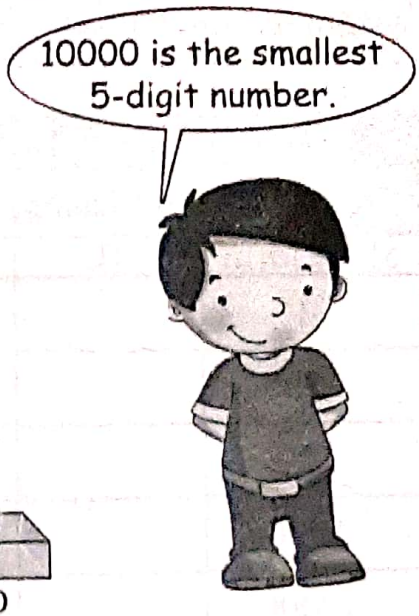
We know that the greatest 4-digit number is 9999.

9999 = 9 Thousands + 9 Hundreds + 9 Tens + 9 Ones

What number comes after 9999?

Let us add 1 to 9999.

9999 + 1 = 10000

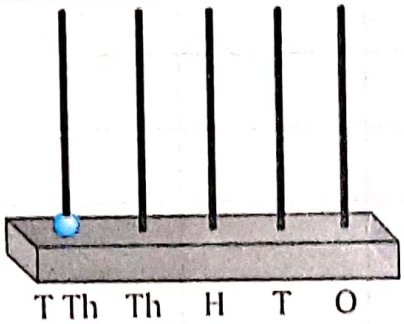


T Th	Th	H	T	O
1	0	0	0	0

It is read as **'ten thousand'**.

T Th denotes the ten thousands place.

On the abacus, it is represented as shown.



Remember : 99999 is the greatest 5-digit number.

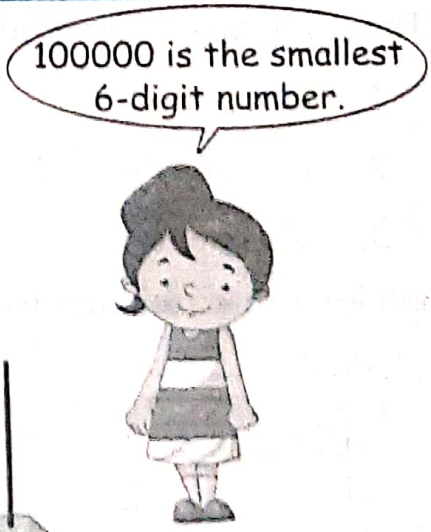
6-Digit Numbers

What number comes after 99999?

99999 + 1 = 100000

100000 is a 6-digit number.

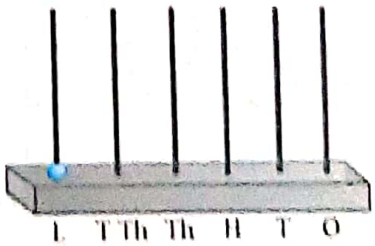
It is read as 'one lakh'.



L	T Th	Th	H	T	O
1	0	0	0	0	0

L denotes the lakhs place.

On the abacus, 100000 is represented as shown.



Remember : 999999 is the greatest 6-digit number.

Reading and Writing Large Numbers

While reading and writing large numbers, we divide them into groups called periods.

Indian Place Value System

In India, we mostly follow the Indian place value system, also called the Hindu-Arabic system of numeration.

Indian place value chart

Periods	Lakhs		Thousands		Ones		
Places	Ten Lakhs	Lakhs	Ten Thousands	Thousands	Hundreds	Tens	Ones
Short form	TL	L	T Th	Th	H	T	O
1							1
10						1	0
100					1	0	0
1000				1	0	0	0
10000			1	0	0	0	0
100000		1	0	0	0	0	0
1000000	1	0	0	0	0	0	0

The seven places are grouped into three periods :

1. Ones period — | H | T | O |
2. Thousands period — | T Th | Th |
3. Lakhs period — | TL | L |

While writing a number, we separate the periods by a comma (,).

Examples :

1.

L	T Th	Th	H	T	O
	2	3	5	4	6

23,546

2.

L	T Th	Th	H	T	O
3	4	5	2	9	0

3,45,290

International Place Value System

The International number system is used in a large number of countries in the world.

International Place Value Chart

Periods	Millions			Thousands			Ones		
Places	Hundred Millions	Ten Millions	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
Short form	HM	TM	M	H Th	T Th	Th	H	T	O
10000					1	0	0	0	0
100000				1	0	0	0	0	0
1000000			1	0	0	0	0	0	0

Here, the three periods are

1. Ones period — | H | T | O |
2. Thousands period — | H Th | T Th | Th |
3. Millions period — | H M | T M | M |

While writing a number in International system also, we separate the periods by a comma (,).

Examples :

1.

M	H Th	T Th	Th	H	T	O
	1	7	3	4	5	6

173,456

2.

M	H Th	T Th	Th	H	T	O
	1	3	4	5	6	7

134,567

Comparison of Indian and International System

Indian System	Ten Lakhs	Lakhs	Ten Thousands	Thousands	Hundreds	Tens	Ones
1000				1	0	0	0
10000			1	0	0	0	0
100000		1	0	0	0	0	0
1000000	1	0	0	0	0	0	0
International system	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

From the above table, we observe that

1. 1 lakh = 1 hundred thousand
2. 10 lakh = 1 million

Number Names

The number name of a number is derived by placing its digits in the place value chart.

Indian place value chart

Number	L	T Th	Th	H	T	O	Number Name
11,156		1	1	1	5	6	Eleven thousand one hundred fifty-six
57,299		5	7	2	9	9	Fifty-seven thousand two hundred ninety-nine
1,14,281	1	1	4	2	8	1	One lakh fourteen thousand two hundred eighty-one
7,89,734	7	8	9	7	3	4	Seven lakh eighty-nine thousand seven hundred thirty-four

International place value chart

Number	M	H Th	T Th	Th	H	T	O	Number Name
304,395		3	0	4	3	9	5	Three hundred four thousand three hundred ninety-five
168,457		1	6	8	4	5	7	One hundred sixty-eight thousand four hundred fifty-seven
199,428		1	9	9	4	2	8	One hundred ninety-nine thousand four hundred twenty-eight

Remember :

1. The period is not written in plural while writing the number.
2. We do not write 'and' in the number name.

Exercise-2

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

1. Arrange the following numbers in Indian place value chart. Rewrite them in blank spaces with commas at the right places.
   (a) 19285 (b) 247158 (c) 725175 (d) 928750
2. Arrange the following numbers in International place value chart. Rewrite them in blank spaces with commas at the right places.
   (a) 48517 (b) 932429 (c) 172359 (d) 327458
3. Write the number names (in Indian system) :
   (a) 53,125 (b) 1,87,819 (c) 9,27,471
4. Write the number names (in International system) :
   (a) 412,351 (b) 167,897 (c) 993,457
5. Write the number putting commas at the right places :
   (a) Eight lakh ninety-nine thousand four hundred twelve
   (b) Seven lakh twenty-five thousand nine hundred thirty-one
   (c) Two hundred thirty-five thousand four hundred sixty-nine
6. Write the smallest and greatest 6-digit numbers both in figures and in words in
   (a) Indian number system (b) International number system

Face Value and Place Value

Face Value of a Digit

The face value of a digit is the value of the digit itself irrespective of its place in the number.

Example : Face value of 2 = 2, Face value of 3 = 3,
Face value of 4 = 4, Face value of 5 = 5,
Face value of 6 = 6, Face value of 7 = 7

Place Value of a Digit

The place value of a digit depends on its position in the number.

Place value of a digit = Face value of the digit × Value of the place in the number

Example : Find the place value of each of the digits in the number 3,27,456.

3,27,456 = 3 lakhs 2 ten thousands 7 thousands 4 hundreds 5 tens 6 ones

Place value of 6 = 6 × 1 = 6 = 6 ones
Place value of 5 = 5 × 10 = 50 = 5 tens

L	T Th	Th	H	T	O
3	2	7	4	5	6

Place value of 4 = 4 × 100 = 400 = 4 hundreds
Place value of 7 = 7 × 1000 = 7,000 = 7 thousands
Place value of 2 = 2 × 10000 = 20,000 = 20 thousands
Place value of 3 = 3 × 100000 = 3,00,000 = 3 lakhs

Expanded Notation of a Number

A number written as the sum of the place values of its digits is called the expanded form of the number.

For example : 8,27,459 = 8 × 1,00,000 + 2 × 10,000 + 7 × 1000 + 4 × 100 + 5 × 10 + 9
= 8,00,000 + 20,000 + 7,000 + 400 + 50 + 9

Example : Write the expanded form of 9,65,307.

Solution :

L	T Th	Th	H	T	O
9	6	5	3	0	7

9,65,307 = 9 × 1,00,000 + 6 × 10,000 + 5 × 1000 + 3 × 100 + 7 × 1
= 9,00,000 + 60,000 + 5000 + 300 + 7

Exercise-3

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

1. **Find the face value and place value of the coloured digit in the given numbers :**
   (a) 13,791 (b) 24,352 (c) 1,47,173 (d) 3,56,735
   (e) 8,23,179 (f) 51,757 (g) 67,236 (h) 9,87,617
2. Find the difference between the place value and face value of 6 in 526521.
3. Find the sum of the place values of two 5s in 235257.
4. **Write the expanded form of the following numbers :**
   (a) 25,308 (b) 75,173 (c) 1,37,478 (d) 3,47,785
   (e) 87,928 (f) 90,494
5. **Write the short form of the following numbers :**
   (a) 1,00,000 + 30,000 + 2,000 + 100 + 70 + 6
   (b) 5,00,000 + 60,000 + 5,000 + 400 + 80 + 7
   (c) 9,00,000 + 90,000 + 9,000 + 900 + 90 + 9
   (d) 70,000 + 5,000 + 60
   (e) 3,00,000 + 6,000 + 70 + 7
   (f) 4,00,000 + 400 + 40 + 4

Successor and Predecessor of a Number

Successor of a number

The successor of a number is 1 more than the number. So, we add 1 to the number to get its successor.

Examples : Successor of 13235 is 13236.
Successor of 99999 is 100000.

$13235 + 1 = 13236$
$99999 + 1 = 100000$

Predecessor of a number

The predecessor of a number is 1 less than the number. So, we subtract 1 from the number to get its predecessor.

Examples : Predecessor of 34569 is 34568.
Predecessor of 160750 is 160749.

$34569 - 1 = 34568$
$160750 - 1 = 160749$

Comparison of Numbers

We have already learnt the comparison of numbers up to four digits. The rules of comparison of greater numbers are the same.

1. If the number of digits are different, then the number with more digits is greater.

   Example : $12345 > 2345$

2. If the number of digits are same, then we start with comparison of the digits from the extreme left.

   - We compare the digits until we find two digits that are different.
   - Compare them to decide which is smaller or greater number.

   Example : $23\textcircled{4}56 > 23\textcircled{1}56$

Let us take some examples to understand.

Example 1 : **Which is greater :** 73456 or 74356?

Solution : Both the numbers are 5-digit numbers.

Comparing the numbers, we see that the digits at the ten thousands place are same.

Comparing the digits at the thousands place, 3 thousands < 4 thousands.

Thus, 74,356 is greater than 73,456.

T Th	Th	H	T	O
7	3	4	5	6
7	4	3	5	6

Example 2 : Which is greater : 6,45,385 or 6,45,107?

Solution : Both the numbers are 6-digit numbers.

L	T Th	Th	H	T	O
6	4	5	3	8	5
6	4	5	1	0	7

Comparing the numbers, we see that the digits at lakhs, ten thousands and thousands places are same.

We compare the digits at the hundreds place.

3 hundreds > 1 hundred

Thus, 6,45,385 is greater than 6,45,107.

Ascending and Descending Order

Ascending order means arranging numbers from smallest to greatest.

Descending order means arranging numbers from greatest to smallest.

Example 1 : Arrange in descending order :

Solution : 42,728 48,715 49,234 47,174

L	T Th	Th	H	T	O
	4	2	7	2	8
	4	8	7	1	5
	4	9	2	3	4
	4	7	1	7	4

Since the digits at the ten thousands place are same in all the numbers, we compare the digits at the thousands place.

Thus, the numbers in descending order are

49,234 > 48,715 > 47,174 > 42,728

Example 2 : Arrange in ascending order :

Solution : 5,23,456 6,27,175 4,23,456 5,17,236

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

Comparing the digits at the extreme left place, we see that 4,23,456 is the smallest and 6,27,175 is the greatest number.

Comparing 5,23,456 and 5,17,236, we see that 5,23,456 > 5,17,236.

Thus, the numbers in ascending order are

4,23,456 < 5,17,236 < 5,23,456 < 6,27,175

Exercise-4

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

1. Write the successor of :
   (a) 13,598 (b) 25,009 (c) 39,900 (d) 78,349
   (e) 1,23,478 (f) 3,47,199
2. Write the predecessor of :
   (a) 39,498 (b) 57,000 (c) 92,450 (d) 1,73,970
   (e) 8,48,300 (f) 1,00,000
3. Write > , < or = in the boxes :
   (a) 10,337 ☐ 10,370 (b) 72,478 ☐ 72,378
   (c) 9,999 ☐ 9,999 (d) 1,22,115 ☐ 1,23,115
   (e) 5,28,179 ☐ 4,28,179 (f) 4,38,790 ☐ 4,48,790
4. Circle the greatest number :
   (a) 1,23,410 1,23,425 1,23,517 1,23,620
   (b) 197,630 198,715 199,215 195,768
5. Arrange in ascending order :
   (a) 20,280 20,820 20,028 20,082
   (b) 89,728 87,128 84,571 89,185
   (c) 3,17,230 4,17,230 5,28,470 4,28,217
6. Arrange in descending order :
   (a) 92,173 93,234 90,148 92,345
   (b) 72,059 72,509 72,590 72,950
   (c) 8,23,333 8,43,126 8,17,338 8,17,238

Puzzle

Using the digits 1 to 9 (each exactly once), form three 3-digit numbers so that the second number is 2 times the first and the third number is 3 times the first.

Forming Numbers

1. **To write the smallest number using the given digits each only once.**

   (a) When none of the digits is zero, we arrange the digits in ascending order and form the number.

   Examples :

   - The smallest 5-digit number using the digits 1, 3, 2, 5 and 9 is 12359.
   - The smallest 6-digit number using the digits 7, 8, 4, 3, 5 and 2 is 234578.

   (b) When one of the digits is zero, we arrange the digits in ascending order and put zero at second place from extreme left while forming the number.

   Example : The smallest 6-digit number using the digits 1, 7, 5, 0, 4 and 8 is 104578.

2. **To write the greatest number using the given digits each only once, we simply arrange the digits in descending order and form the number.**

   Examples :

   - The greatest 5-digit number using the digits 3, 5, 1, 7 and 9 is 97531.
   - The greatest 6-digit number using the digits 8, 0, 5, 1, 3 and 9 is 985310.

3. **To write the smallest or greatest number using the given digits, with repetition of digits, we first form the smallest or greatest number using the given digits each only once. Then we place the digit to be repeated.**

   Examples :

   - The smallest 5-digit number using the digits 1, 4, 3, 7 repeating 4 twice is 13447.
   - The greatest 6-digit number using the digits 7, 0, 2, 8, 9 repeating 7 twice is 987720.

Exercise-5

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

1. Write the smallest and greatest 5-digit numbers using the given digits each only once :

   (a) 4, 2, 9, 7, 3 (b) 1, 3, 7, 0, 9 (c) 5, 9, 3, 1, 7

2. Write the smallest and greatest 5-digit numbers using the given digits, repeating 4 twice :

   (a) 1, 4, 2, 5 (b) 3, 4, 0, 8 (c) 9, 3, 4, 5

3. Form the smallest 6-digit number using the digits 1, 3, 0, 5, 7 and 6 each only once.
4. Form the greatest 6-digit number using the digits 7, 8, 9, 3 and 5, repeating 8 twice.
5. Form the smallest 5-digit number using the digits 1, 3, 5 and 0, repeating 1 twice.

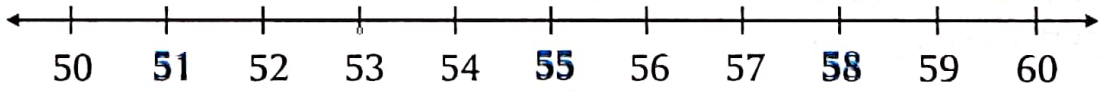
Rounding Numbers

In our daily life, we come across situations where we do not know the exact answer to some quantities. We give an answer which has been rounded off to the nearest tens, hundreds or thousands as the case may be.

Number of people who attended the music programme was about 1200.

Rounding to the Nearest Tens

Consider the numbers 51, 58 and 55.



1. 51 is nearer to 50 than to 60. So, 51 is rounded off to 50.
2. 58 is nearer to 60 than to 50. So, 58 is rounded off to 60.
3. 55 is halfway between 50 and 60. So, 55 is rounded off to 60.

Look at the digit at the ones place :

1. **If the digit at the ones place is less than 5, replace the ones digit by 0 and keep the other digits same.**
2. **If the digit at the ones place is equal to or more than 5, replace the ones digit by 0 and increase the tens digit by 1.**

Examples : Round off to the nearest tens.

1. 84 → The ones digit $4 < 5$, so, 84 is rounded off to 80.
2. 956 → The ones digit $6 > 5$, so, 956 is rounded off to 960.
3. 1289 → The ones digit $9 > 5$, so, 1289 is rounded off to 1290.

Rounding to the Nearest Hundreds

Consider the numbers 728, 750 and 769 all lying between 700 and 800.

1. 728 is nearer to 700 than to 800. So, 728 is rounded off to 700.
2. 750 lies halfway between 700 and 800. So, 750 is rounded off to 800.
3. 769 is nearer to 800 than to 700. So, 769 is rounded off to 800.

Look at the digit at the tens place :

1. **If the digit at the tens place is less than 5, replace the tens and ones digits by 0 and keep the other digits same.**
2. **If the digit at the tens place is equal to or more than 5, replace the tens and ones digits by 0 and increase the hundreds digit by 1.**

Examples : Round off to the nearest hundreds.

1. 639 → The tens digit $3 < 5$, so, 639 is rounded off to 600.
2. 2382 → The tens digit $8 > 5$, so, 2382 is rounded off to 2400.
3. 34656 → The tens digit is 5, so, 34656 is rounded off to 34700.

Rounding to the Nearest Thousands

Consider the numbers 9387, 9687 and 9587 all lying between 9000 and 10000.

1. 9387 is nearer to 9000 than to 10000.
   So, 9387 is rounded off to 9000.
2. 9687 is nearer to 10000 than to 9000.
   So, 9687 is rounded off to 10000.
3. 9587 is nearer to 10000 than to 9000.
   So, 9587 is rounded off to 10000.

Look at the digit at the hundreds place :

1. **If the digit at the hundreds place is less than 5, replace the hundreds, tens and ones digits by 0 and keep the other digits same.**
2. **If the digit at the hundreds place is equal to or more than 5, replace the hundreds, tens and ones digits by 0 and increase the thousands digit by 1.**

Examples : Round off to the nearest thousands.

1. 3787 → The hundreds digit $7 > 5$, so, 3787 is rounded off to 4000.
2. 10349 → The hundreds digit $3 < 5$, so, 10349 is rounded off to 10000.
3. 10597 → The hundreds digit is 5, so, 10597 is rounded off to 11000.

Exercise-6

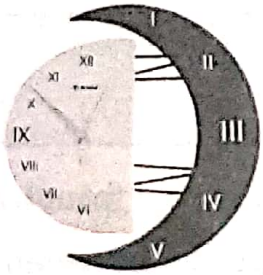
Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

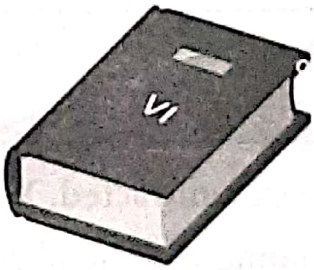
1. Round off to the nearest tens :
   (a) 57 (b) 93 (c) 291 (d) 375 (e) 588
   (f) 774 (g) 819 (h) 983 (i) 1733 (j) 35876
2. Round off to the nearest hundreds :
   (a) 446 (b) 719 (c) 983 (d) 1185 (e) 1736
   (f) 6253 (g) 8899 (h) 15728 (i) 18997 (j) 24364
3. Round off to the nearest thousands :
   (a) 3278 (b) 6938 (c) 7171 (d) 9569 (e) 10734
   (f) 12617 (g) 45817 (h) 73417 (i) 99978 (j) 32871

Roman Numerals

Roman numerals were developed by the Romans.

However, we still use them in our daily life. We often find these numerals on the faces of certain clocks, books.





The Romans used only seven letters of English alphabet to form numbers.

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

Various combinations of these seven symbols are used to create numbers.

Let us learn to form Roman numerals of numbers up to 100.

We follow some basic rules to write Roman numerals.

1. The symbols I and X can be used up to three times in a number and the values are added.

II = 1 + 1 = 2,	III = 1 + 1 + 1 = 3
XX = 10 + 10 = 20,	XXX = 10 + 10 + 10 = 30

Remember : The symbols V, L and D are never repeated.
So, 10 is written as X and not VV.
Similarly, 100 is written as C and not LL.

2. A Roman numeral of smaller value written on the right of a Roman numeral of greater value is added to the numeral of greater value.

VII	= 5 + 1 + 1 = 7
XXIII	= 10 + 10 + 1 + 1 + 1 = 23
LXI	= 50 + 10 + 1 = 61

3. A Roman numeral of smaller value written on the left of a Roman numeral of greater value is subtracted from the numeral of greater value.

IX = 10 – 1 = 9,	XL = 50 – 10 = 40
XC = 100 – 10 = 90,	CD = 500 – 100 = 400

V, L and D are never subtracted. X can be subtracted from L and C only once.

4. When a Roman numeral of smaller value is placed between two Roman numerals of greater values, its value is always subtracted from the value of the symbol on its right.

XIV	= 10 + (5 – 1) = 10 + 4 = 14
XXIX	= 10 + 10 + (10 – 1) = 10 + 10 + 9 = 10 + 19 = 29

Remember : A Roman numeral of smaller value can be written on the left of a Roman numeral of greater value only once.
So, IIV, IIIX and XXL are incorrect numerals.

Examples :

Hindu-Arabic Numeral		Roman Numeral	
8	5 + 3	V + III	VIII
15	10 + 5	X + V	XV
21	20 + 1	XX + I	XXI
24	20 + (5 – 1)	XX + (V – I)	XXIV
37	30 +5 + 2	XXX + V + II	XXXVII
40	50 – 10	L – X	XL
53	50 + 3	L + III	LIII
63	50 + 10 + 3	L + X + III	LXIII
79	50 + 20 + (10 – 1)	L + XX + (X – I)	LXXIX
89	50 + 30 + (10 – 1)	L + XXX + (X – I)	LXXXIX
90	100 – 10	C – X	XC
99	(100 – 10) + 9	(C – X) + IX	XCIX

Exercise-7

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

1. Write the Roman numeral for :
   (a) 52 (b) 65 (c) 79 (d) 84 (e) 91 (f) 94
2. Write the Hindu-Arabic numeral for :
   (a) XLI (b) LXXIV (c) LXXVII (d) LXXX (e) XCVII (f) XCV
3. Write >, < or = :
   (a) 34 ☐ XXXIV (b) LXIII ☐ 73
   (c) XCVIII ☐ XCIX (d) LX ☐ XL
4. Write the answer in Roman numerals :
   (a) XXIII + V (b) XXXIX + VIII
   (c) XC + XL (d) V + XII

HOTS Question

Form the greatest and smallest 5-digit numbers using the digits 4, 2, 0 and 8, repeating 2 twice. Also, find their difference.

2 Addition

Use **Cordova Smart Class Software** on the **smart board** in class to learn about addition.

The students of various schools have gathered for Inter-school sports competition. There are 1251 boys and 1089 girls.

Total number of students is 1251 + 1089 = 2340

	Th	H	T	O	
		(1)	(1)		
	1	2	5	1	← addend
+	1	0	8	9	← addend
	2	3	4	0	← sum

The numbers to be added are called the **addends** and the answer in addition is called the **sum**.

Exercise-1

Do you remember .....

Arrange in vertical columns and add :

1. 325 + 172
2. 1753 + 417
3. 6133 + 2192
4. 2614 + 7346
5. 2347 + 3215 + 1178
6. 1113 + 2244 + 3366

Addition of 5-digit and 6-digit Numbers

In previous classes, we have learnt to add 3-digit and 4-digit numbers with or without regrouping. In the same way, we can add 5-digit and 6-digit numbers.

Step 1 : Add the ones.
Step 2 : Add the tens.
Step 3 : Add the hundreds.
Step 4 : Add the thousands.
Step 5 : Add the ten thousands. (For 5-digit numbers)
Step 6 : Add the lakhs. (For 6-digit numbers)

Addition of 5-digit Numbers

1. Add 43,165 and 25,412.

TTh	Th	H	T	O
4	3	1	6	5
+ 2	5	4	1	2
6	8	5	7	7

43,165 + 25,412 = 68,577

Add ones : 5 + 2 = 7 ones
Add tens : 6 + 1 = 7 tens
Add hundreds : 1 + 4 = 5 hundreds
Add thousands : 3 + 5 = 8 thousands
Add ten thousands : 4 + 2 = 6 ten thousands

2. Add 38,653 and 12,845.

Add ones : 3 + 5 = 8 ones
Add tens : 5 + 4 = 9 tens
Add hundreds : 6 + 8 = 14 hundreds
= 1 thousand + 4 hundreds
Carry over 1 to the thousands place.
Add thousands : 1 + 8 + 2 = 11 thousands
= 10 thousands + 1 thousand
Carry over 1 to the ten thousands place.
Add ten thousands : 1 + 3 + 1 = 5 ten thousands

TTh	Th	H	T	O
(1)	(1)			
3	8	6	5	3
+ 1	2	8	4	5
5	1	4	9	8

38,653 + 12,845 = 51,498

Exercise-2

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

1. **Find the sum of :**
   (a) 23,312 and 35,233 (b) 40,718 and 57,161 (c) 72,354 and 13,215
   (d) 52,735 and 35,025 (e) 15,427 and 67,553 (f) 49,999 and 26,745

2. **Add :**

a

TTh	Th	H	T	O
3	3	0	2	1
+ 2	3	5	6	8

b

TTh	Th	H	T	O
4	1	8	5	3
+ 2	2	0	1	4

c

TTh	Th	H	T	O
2	4	5	1	3
+ 5	2	3	4	0

d

TTh	Th	H	T	O
3	8	4	2	7
+ 4	2	8	1	2

e

TTh	Th	H	T	O
5	2	7	6	8
+ 1	6	7	2	0

f

TTh	Th	H	T	O
7	5	7	8	3
+ 1	4	7	0	2

Addition of 6-digit Numbers

1. Add 6,21,021 and 3,64,835.

L	T Th	Th	H	T	O
6	2	1	0	2	1
+ 3	6	4	8	3	5
9	8	5	8	5	6

6,21,021 + 3,64,835 = 9,85,856

Add ones : 1 + 5 = 6 ones
Add tens : 2 + 3 = 5 tens
Add hundreds : 0 + 8 = 8 hundreds
Add thousands : 1 + 4 = 5 thousands
Add ten thousands : 2 + 6 = 8 ten thousands
Add lakhs : 6 + 3 = 9 lakhs

2. Add 8,19,246 and 1,65,083.

Add ones : 6 + 3 = 9 ones
Add tens : 4 + 8 = 12 tens
= 1 hundred + 2 tens
Carry over 1 to the hundreds place.
Add hundreds : 1 + 2 + 0 = 3 hundreds
Add thousands : 9 + 5 = 14 thousands
= 1 ten thousand + 4 thousands
Carry over 1 to the ten thousands place.
Add ten thousands : 1 + 1 + 6 = 8 ten thousands
Add lakhs : 8 + 1 = 9 lakhs

L	T Th	Th	H	T	O
	①		①		
8	1	9	2	4	6
+ 1	6	5	0	8	3
9	8	4	3	2	9

8,19,246 + 1,65,083 = 9,84,329

Exercise-3

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

1. Add :

a

L	T Th	Th	H	T	O
6	5	4	3	2	1
+ 1	2	3	4	5	6

b

L	T Th	Th	H	T	O
3	2	8	5	1	7
+ 2	1	0	3	2	1

c

L	T Th	Th	H	T	O
○	○	○	○	○	
2	3	4	5	6	7
+ 4	3	2	7	6	5

d

L	T Th	Th	H	T	O
○	○	○	○	○	
5	3	1	7	8	6
+ 1	7	3	4	3	8

2. Find the sum of :

(a) 1,54,023 and 4,21,746

(b) 2,40,125 and 3,47,521

(c) 6,52,813 and 2,07,045

(d) 5,12,345 and 2,34,651

(e) 3,48,978 and 3,45,678

(f) 2,45,386 and 4,25,297

(g) 5,27,123 and 3,17,298

(h) 4,97,513 and 3,48,789

Properties of Addition

1. When we add 0 to a number, the sum is the number itself.

Examples : $7254 + 0 = 7254$

$47289 + 0 = 47289$

2. When 1 is added to a number, the sum is the successor of the number.

Examples : $3270 + 1 = 3271$

$81399 + 1 = 81400$

3. A change in the order of the addends does not change the sum of the two numbers. This property is called the **order property of addition.**

   Example : 42310 + 23410 = 23410 + 42310

4. A change in the grouping of the addends does not change the sum of the three numbers. This property is called the **grouping property of addition.**

   Example : (12345 + 54321) + 11111 = 12345 + (54321 + 11111)

Exercise-4

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

Fill in the boxes :

1. 4634 + ☐ = 4634
2. 21346 + 1 = ☐
3. 53476 + 0 = ☐
4. 34567 + ☐ = 34568
5. 14357 + 19235 = 19235 + ☐
6. 82547 + (35458 + 10000) = (82547 + ☐) + 10000
7. (112000 + 135400) + 234567 = 112000 + (135400 + ☐)

Exercise-5

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

1. The cost of a motorcycle is ₹42,850 and the cost of a scooter is ₹28,350. What is the total cost of both the vehicles?
2. A factory manufactured 72,584 locks in the year 2016 and 37,846 locks in the year 2017. How many locks did the factory manufacture in the two years?
3. During a census, it was found that there were 2,34,786 males and 1,93,877 females in a town. Find the total population of the town.
4. A number exceeds 8,76,543 by 12,345. Find the number.

HOTS Question

Fill in the boxes using correct digits :

a

	4	☐	1	0	6
+	5	0	9	☐	4
	☐	6	☐	8	☐

b

	3	☐	4	5	9
	☐	2	6	☐	4
+	1	3	☐	2	☐
	7	2	5	8	4

3 Subtraction

Use **Cordova Smart Class Software** on the **smart board** in class to learn about subtraction.

The final match of a hockey tournament is being played between India and Australia in Delhi. Many people have come to cheer up the teams. There are 9670 people in all, out of which 7489 are males. How many females have come to see the match?

	Th	H	T	O	
		(5)	(16)	(10)	
	9	~~6~~	~~7~~	~~0~~	← minuend
−	7	4	8	9	← subtrahend
	2	1	8	1	← difference

Hence, 2181 females have come to see the match.

The number from which we subtract the other number is called the **minuend**. The number to be subtracted is called the **subtrahend**. The answer in subtraction is called the **difference**.

Exercise-1

Do you remember . . . . .

1. **Write the numbers in vertical columns and subtract :**
   (a) 4254 − 1832 (b) 6456 − 3148 (c) 9778 − 5489
2. The sum of two numbers is 5885. If one of them is 3176, find the other number.
3. Ravi buys a watch and a video game for ₹6885. The cost of the watch is ₹2875. What is the cost of the video game?

Subtraction of 5-digit and 6-digit Numbers

The subtraction of 5-digit and 6-digit numbers is same as subtraction of 4-digit numbers.

Step 1 : Subtract the ones.
Step 2 : Subtract the tens.
Step 3 : Subtract the hundreds.
Step 4 : Subtract the thousands.
Step 5 : Subtract the ten thousands. (For 5-digit numbers)
Step 6 : Subtract the lakhs. (For 6-digit numbers)

Subtraction of 5-digit Numbers

Example 1 : Subtract 12345 from 55555.

Solution :

Subtract ones : 5 – 5 = 0 ones

Subtract tens : 5 – 4 = 1 ten

Subtract hundreds : 5 – 3 = 2 hundreds

Subtract thousands : 5 – 2 = 3 thousands

Subtract ten thousands : 5 – 1 = 4 ten thousands

TTh	Th	H	T	O
5	5	5	5	5
–1	2	3	4	5
4	3	2	1	0

55555 – 12345 = 43210

Example 2 : Subtract 34517 from 65485.

Solution :

Step 1 : Subtract the ones :

Here, 5 ones < 7 ones, so we regroup.

8 tens 5 ones = 7 tens 15 ones

15 ones – 7 ones = 8 ones

Write 8 in the ones place.

Step 2 : Subtract the tens :

7 tens – 1 ten = 6 tens

Write 6 in the tens place.

Step 3 : Subtract the hundreds :

Here, 4 hundreds < 5 hundreds, so we regroup.

5 thousands 4 hundreds = 4 thousands 14 hundreds

14 hundreds – 5 hundreds = 9 hundreds

Write 9 in the hundreds place.

Step 4 : Subtract the thousands :

4 thousands – 4 thousands = 0 thousands

Write 0 in the thousands place.

Step 5 : Subtract the ten thousands :

6 ten thousands – 3 ten thousands = 3 ten thousands

Write 3 in the ten thousands place.

TTh	Th	H	T	O	
	(4)	(14)	(7)	(15)	← After borrowing
6	~~5~~	~~4~~	~~8~~	~~5~~	
– 3	4	5	1	7	
3	0	9	6	8	

65485 – 34517 = 30968

Exercise-2

Use Cordova Smart Class Software on the smart board in class to do Exercise.

1. Subtract:

a

TTh	Th	H	T	O
2	8	4	5	6
– 1	4	2	3	2

b

TTh	Th	H	T	O
5	7	9	1	3
– 2	4	6	0	1

c

TTh	Th	H	T	O
7	7	7	7	7
– 4	2	4	2	4

d

TTh	Th	H	T	O
○	○	○	○	○
5	3	2	1	5
– 3	9	0	0	6

e

TTh	Th	H	T	O
○	○	○	○	○
6	0	0	0	0
– 4	5	4	5	4

f

TTh	Th	H	T	O
○	○	○	○	○
7	5	4	6	7
– 4	1	3	5	8

2. Subtract:

(a) 51834 – 20512 (b) 89462 – 27230 (c) 33333 – 12321
(d) 74156 – 32034 (e) 74156 – 25364 (f) 66000 – 9999
(g) 93115 – 87767 (h) 78378 – 36089 (i) 24008 – 21778
(j) 47234 – 13532 (k) 62345 – 17828 (l) 99999 – 23458

3. Subtract the greatest 5-digit number from the smallest 6-digit number.

Subtraction of 6-digit Numbers

1. Subtract 2,53,542 from 7,96,775.

L	T Th	Th	H	T	O
7	9	6	7	7	5
– 2	5	3	5	4	2
5	4	3	2	3	3

7,96,775 – 2,53,542 = 5,43,233

2. Subtract 1,37,469 from 4,15,824.

L	T Th	Th	H	T	O
③	⑩	⑮	⑦	⑪	⑭
~~4~~	~~1~~	~~5~~	~~8~~	~~2~~	~~4~~
– 1	3	7	4	6	9
2	7	8	3	5	5

4,15,824 – 1,37,469 = 2,78,355

3. Subtract 3,56,255 from 6,00,000.

L	T Th	Th	H	T	O
⑤	⑨	⑨	⑨	⑨	⑩
~~6~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
− 3	5	6	2	5	5
2	4	3	7	4	5

6 lakhs = 5 lakhs + 10 ten thousands
10 ten thousands = 9 ten thousands + 10 thousands
10 thousands = 9 thousands + 10 hundreds
10 hundreds = 9 hundreds + 10 tens
10 tens = 9 tens + 10 ones

6,00,000 − 3,56,255 = 2,43,745

Exercise-3

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

1. Subtract :

a
$$\begin{array}{r} 285469 \\ -\ 135344 \\ \hline \\ \hline \end{array}$$

b
$$\begin{array}{r} 719654 \\ -\ 408531 \\ \hline \\ \hline \end{array}$$

c
$$\begin{array}{r} 864318 \\ -\ 443207 \\ \hline \\ \hline \end{array}$$

d
$$\begin{array}{r} \bigcirc\bigcirc\bigcirc\bigcirc\bigcirc\bigcirc \\ 358473 \\ -\ 101986 \\ \hline \\ \hline \end{array}$$

e
$$\begin{array}{r} \bigcirc\bigcirc\bigcirc\bigcirc\bigcirc\bigcirc \\ 532640 \\ -\ 275324 \\ \hline \\ \hline \end{array}$$

f
$$\begin{array}{r} \bigcirc\bigcirc\bigcirc\bigcirc\bigcirc \\ 64367 2 \\ -\ 319517 \\ \hline \\ \hline \end{array}$$

2. Find the difference between :
   (a) 4,83,695 and 1,51,343
   (b) 6,31,296 and 4,61,053
   (c) 7,14,345 and 5,37,705
   (d) 6,67,800 and 3,45,925

3. Fill in the boxes with correct digits :

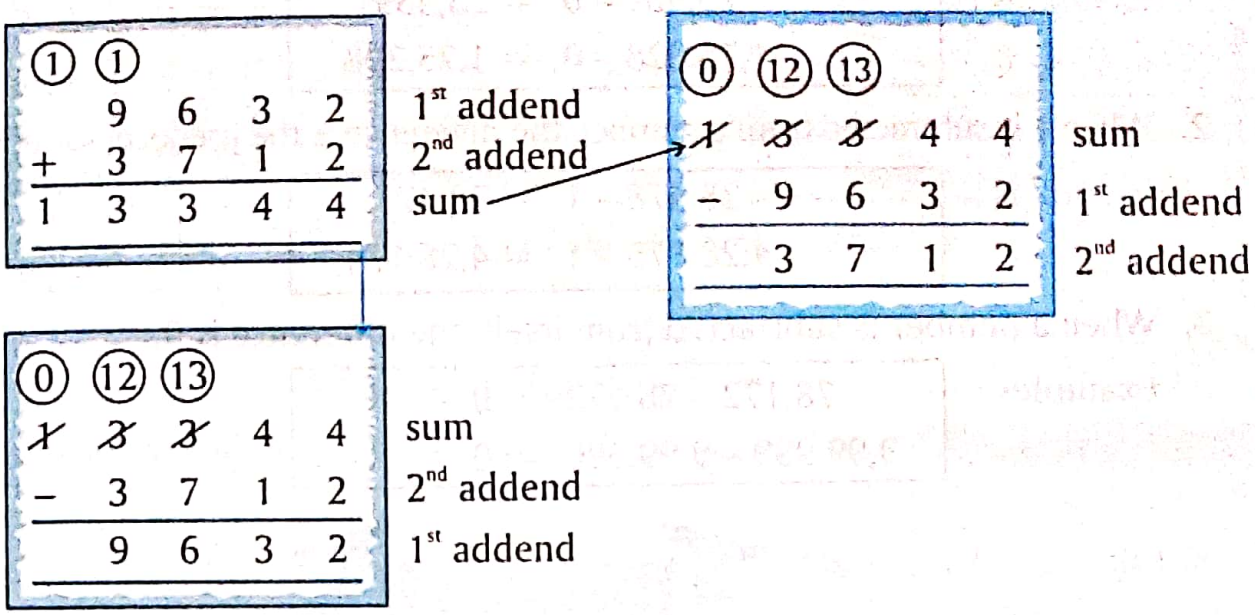
a
$$\begin{array}{r} 7\ 6\ \square\ 1\ \square\ 5 \\ -\ \square\ 2\ 1\ \square\ 0\ 8 \\ \hline 3\ \square\ 1\ 8\ 3\ \square \\ \hline \end{array}$$

b
$$\begin{array}{r} 8\ \square\ 6\ 7\ \square\ 4 \\ -\ 2\ 5\ \square\ 5\ 4\ 2 \\ \hline \square\ 4\ 3\ \square\ 3\ \square \\ \hline \end{array}$$

Checking the Answer for Addition and Subtraction

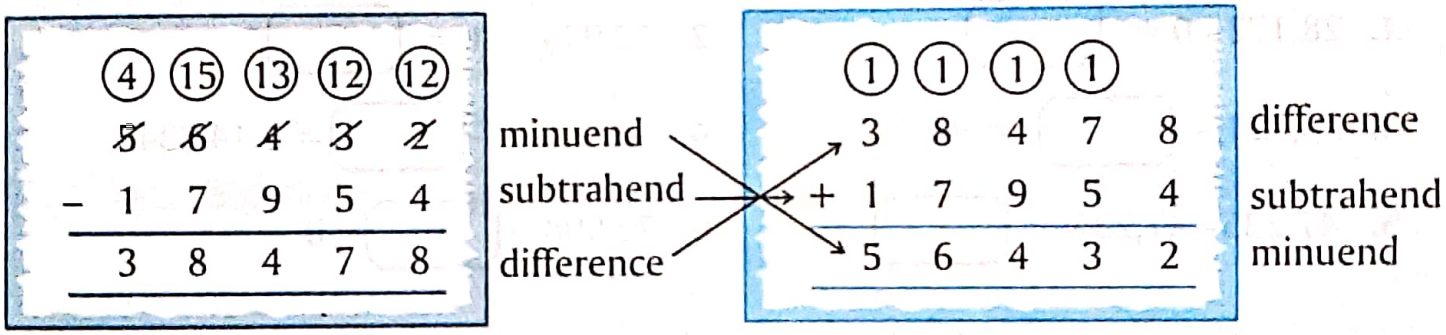
On subtracting any of the addends from the sum, we get the other addend.

Example :



On adding the difference and the subtrahend, we get the minuend.

Example :



Exercise-4

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

Solve the following and check your answer :

1. 5 4 3 2
+ 6 3 1 4

2. 8 9 6 4 3
+ 5 4 3 9 2

3. 6 7 4 3 1
– 5 9 9 8 1

Properties of Subtraction

1. When 0 is subtracted from a number, the difference is the number itself.

Examples :

$$23,459 - 0 = 23,459$$
$$1,75,328 - 0 = 1,75,328$$

2. When 1 is subtracted from a number, the difference is the predecessor of the number.

Examples :

$$38,478 - 1 = 38,477$$
$$4,28,175 - 1 = 4,28,174$$

3. When a number is subtracted from itself, the difference is 0.

Examples :

$$78,172 - 78,172 = 0$$
$$9,99,999 - 9,99,999 = 0$$

Exercise-5

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

Fill in the boxes :

1. $28,172 - 0 =$ ☐
2. $72,999 - 1 =$ ☐
3. $98,233 -$ ☐ $= 98,232$
4. $1,14,234 -$ ☐ $= 1,14,234$
5. $47,235 - 47,235 =$ ☐
6. $72,998 -$ ☐ $= 0$

Addition and Subtraction Together

1. **Simplify :** $7,53,025 + 1,80,734 - 5,17,315$

Step 1

$$\begin{array}{r} {\scriptstyle (1)\ \ \ \ \ \ } \\ 7\ 5\ 3\ 0\ 2\ 5 \\ +\ 1\ 8\ 0\ 7\ 3\ 4 \\ \hline 9\ 3\ 3\ 7\ 5\ 9 \end{array}$$

Step 2

$$\begin{array}{r} {\scriptstyle (2)(13)\ \ \ \ \ \ } \\ 9\ \not{3}\ \not{3}\ 7\ 5\ 9 \\ -\ 5\ 1\ 7\ 3\ 1\ 5 \\ \hline 4\ 1\ 6\ 4\ 4\ 4 \end{array}$$

$$7,53,025 + 1,80,734 - 5,17,315 = 4,16,444$$

2. Simplify: 2,51,764 – 1,30,324 + 2,15,246 – 83,569

Step 1

$$\begin{array}{r} 2\,5\,1\,7\,6\,4 \\ -\,1\,3\,0\,3\,2\,4 \\ \hline 1\,2\,1\,4\,4\,0 \end{array}$$

Step 2

$$\begin{array}{r} 1\,2\,1\,4\,4\,0 \\ +\,2\,1\,5\,2\,4\,6 \\ \hline 3\,3\,6\,6\,8\,6 \end{array}$$

Step 3

$$\begin{array}{r} \overset{2}{\cancel{3}}\,\overset{13}{\cancel{3}}\,6\,6\,\overset{7}{\cancel{8}}\,\overset{16}{\cancel{6}} \\ -\quad 8\,3\,5\,6\,9 \\ \hline 2\,5\,3\,1\,1\,7 \end{array}$$

2,51,764 – 1,30,324 + 2,15,246 – 83,569 = 2,53,117

Exercise-6

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

1. Simplify :
   (a) 2,51,743 + 6,21,301 – 1,19,254
   (b) 4,31,296 + 2,17,175 – 50,178
   (c) 3,00,192 + 4,32,170 – 2,99,429
   (d) 9,99,999 – 2,22,222 + 3,33,333
   (e) 5,29,516 – 1,02,053 + 25,970 – 18,325
2. From the sum of 5,45,327 and 3,25,173, subtract their difference.

Exercise-7

Use **Cordova Smart Class Software** on the **smart board** in class to do Exercise.

Word Problems

1. The sum of two numbers is 57,295. If one number is 25,487, find the other number.
2. The population of a city is 4,75,173. If the number of males is 2,58,745, find the number of females in the city.
3. What must be added to 43,172 to get 82,054?
4. Mrs Khanna has ₹8,28,050 in her bank account. She spends ₹4,57,375 to buy a new car. How much money is left in her bank account?
5. 1,45,280 students appeared in an examination. If 1,28,425 students passed the examination, how many students failed?
6. Raja bought a television set for ₹38,450. He gave ₹40,000 to the shopkeeper. How much money did he get back?
7. A dictionary has 88,728 words. Mohan has read 37,487 words out of these. How many words are left to be read?

Estimation in Addition and Subtraction

Estimation in addition/subtraction means to guess the sum/difference by rounding off the numbers. The estimated sum/difference differs from the actual sum/difference.

Example 1 : Estimate the sum of 53 and 72 and find the actual sum also.

Solution :

53 rounded off to the nearest tens = 50

72 rounded off to the nearest tens = + 70

Estimated sum = 120

Actual sum =

$$\begin{array}{r} 53 \\ +\ 72 \\ \hline 125 \end{array}$$

We see that, the estimated sum differs from the actual sum by 5.

Example 2 : Estimate the difference of 95 and 67 and find the actual difference also.

Solution :

95 rounded off to the nearest tens = 100

67 rounded off to the nearest tens = − 70

Estimated difference = 30

Actual difference =

$$\begin{array}{r} 95 \\ -\ 67 \\ \hline 28 \end{array}$$

We see that, the estimated difference differs from the actual difference by 2.

Example 3 : Estimate the sum and difference of 452 and 356.

Solution : 452 rounded off to the nearest tens = 450

356 rounded off to the nearest tens = 360

Estimated sum

$$\begin{array}{r} 450 \\ +\ 360 \\ \hline 810 \end{array}$$

Estimated difference

$$\begin{array}{r} 450 \\ -\ 360 \\ \hline 90 \end{array}$$

We can estimate the sum and difference of the given numbers by rounding off them to the nearest hundreds.

452 rounded off to the nearest hundreds = 500

356 rounded off to the nearest hundreds = 400

Estimated sum

$$\begin{array}{r} 500 \\ +\ 400 \\ \hline 900 \end{array}$$

Estimated difference

$$\begin{array}{r} 500 \\ -\ 400 \\ \hline 100 \end{array}$$

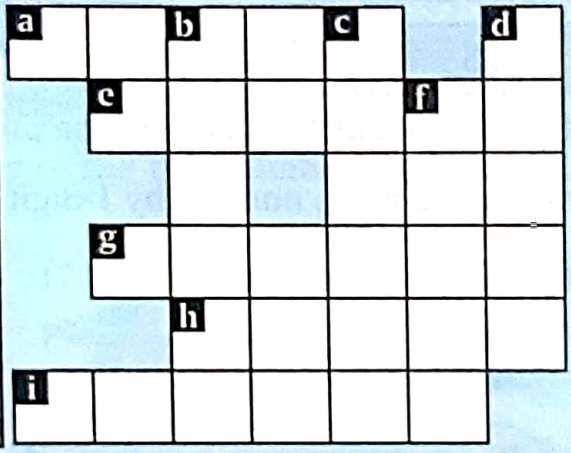
Exercise-8

Use Cordova Smart Class Software on the smart board in class to do Exercise.

1. Estimate each of the following by rounding off to the nearest tens :
   (a) 45 + 56 (b) 635 + 425 (c) 486 + 36
2. Estimate each of the following by rounding off to the nearest tens :
   (a) 67 – 18 (b) 356 – 215 (c) 687 – 38
3. Estimate the sum of 725 and 836 by rounding off to the nearest hundreds.
4. Estimate the difference of 956 and 481 by rounding off to the nearest hundreds.

HOTS Question

Complete the cross number puzzle.



Across →

(a) 63548 – 3000
(e) 382622 – 50000
(g) 422084 – 20
(h) 81585 – 1000
(i) 900000 – 800000

Down ↓

(b) 539280 – 1000
(c) 864050 – 4000
(d) 13345 – 1000
(f) 26680 – 2000