

Chapter- 3

ADDITION

STUDY NOTES

- * Properties of Addition
- * Addition of Two 2-digit Numbers (without carry over)
- * Addition by Regrouping or Carry Over
- * Addition of 2-digit Numbers by Regrouping (or carry over)
- * Regrouping Tens into Hundreds and Tens
- * Addition of a 1-digit or a 2-digit Number to a 3-digit Number (With carry over)
- * Addition of Two 3-digit numbers
- * Addition of Three 3-digit Numbers
- * Word Problems

INTRODUCTION:

Addition is putting together and counting. To add means to combine. The sign of addition is '+' (plus). The answer we get after adding is called the sum.

1. Properties of Addition

EXPLANATION

- I. The sum obtained upon addition of 2 or more numbers remains the same, even after changing their order.

● FOR EXAMPLE

1) $55 + 22 = 77$

$22 + 55 = 77$

2) $25 + 33 = 58$

$33 + 25 = 58$

II. The sum obtained after adding 0 to any number is the **number itself**.

● FOR EXAMPLE

1) $56 + 0 = 56$

2) $89 + 0 = 89$

III. The sum obtained after adding 1 to any number is the **next number**, also called the **successor** of that number.

● FOR EXAMPLE

1) $67 + 1 = 68$

2) $89 + 1 = 90$

2. Addition of Two 2-digit Numbers (without carry over)

EXPLANATION

Addition of two 2-digit numbers means finding the total or sum of two or more numbers by combining them. Two digit numbers are numbers with 2 digits from 11 to 99. Let us take two 2-digit numbers having digits 0 to 5. Say 24 and 31.

● FOR EXAMPLE

1) Add 54 and 32. T O

24

+ 31

55

Method :

Step 1: Write the tens digit below tens column and the ones digit below ones column.

Step 2: Add the ones together and write below ones column.

$$4 \text{ ones} + 1 \text{ one} = 5 \text{ ones}$$

Step 3: Then add tens together and write below tens column.

$$2 \text{ tens} + 3 \text{ tens} = 5 \text{ tens}$$

Ans.55

3. Addition by Regrouping or carry over :

A. Regrouping ones into Tens and Ones:

EXPLANATION

While adding, if the sum at ones' place is ten or more, we regroup the ones in such a way that ten ones are carried to the tens place as one ten and we write the remaining at the ones' place.

● **FOR EXAMPLE**

$$14 \text{ ones} = 10 \text{ ones} + 4 \text{ ones}$$

On regrouping the ones, we write

$$14 \text{ ones} = 1 \text{ ten} + 4 \text{ ones}$$

1. Regroup 6 tens and 13 ones.

Solution: 6 tens + 13 ones

$$= 6 \text{ tens} + 10 \text{ ones} + 3 \text{ ones}$$

$$= 6 \text{ tens} + 1 \text{ ten} + 3 \text{ ones}$$

$$= 7 \text{ tens} + 3 \text{ ones}$$

4. Addition of 2-digit Numbers by Regrouping (or carry over):

EXPLANATION

Let us consider two 2- digit numbers 34 and 47 . Now let us recall how to add by regrouping or carry over. Write one number below the other and then add. At first we have to add the ones place i.e $4+7 = 11$, we have to write 1 under ones place and carry 1 ten to the tens place, now add the tens place $3+4 = 7 + 1 = 8$. So the answer is 81.

● FOR EXAMPLE:

1. Add 34 and 47. **3 tens + 4 ones**

Solution:

$$\begin{array}{r} + 4 \text{ tens} + 7 \text{ ones} \\ \hline \end{array}$$

$$\begin{array}{r} \text{T} \quad \text{O} \\ 3 \quad 4 \\ \hline + 4 \quad 7 \\ \hline \end{array} \quad \begin{array}{r} 7 \text{ tens} + 11 \text{ ones} \\ \hline = 7 \text{ tens} + 10 \text{ ones} + 1 \text{ one} \end{array}$$

$$\begin{array}{r} +4 \quad 7 \\ \hline \end{array} \quad \begin{array}{r} 7 \text{ tens} + 1 \text{ ten} + 1 \text{ one} \\ \hline \end{array}$$

$$\begin{array}{r} 8 \quad 1 \\ \hline \end{array} \quad \begin{array}{r} 8 \text{ tens} + 1 \text{ one} = 81 \\ \hline \end{array}$$

Ans.81

2. Add 12,23 and 36. **Step-1 : Add the ones together .**

$$\begin{array}{r} \text{T} \quad \text{O} \\ 1 \quad 4 \\ 2 \quad 3 \\ \hline \end{array} \quad \begin{array}{r} 4 \text{ ones} + 3 \text{ ones} + 6 \text{ ones} = 13 \text{ ones} \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ 23 \\ \hline \end{array} \quad \begin{array}{r} 13 \text{ ones} = 10 \text{ ones} + 3 \text{ ones} \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ 23 \\ \hline \end{array} \quad \begin{array}{r} = 1 \text{ ten} + 3 \text{ ones} \\ \hline \end{array}$$

$$+ \underline{36}$$

Write 3 under ones' column and carry over 1 ten to the tens column.

$$\underline{73}$$

Step 2: Add the tens together including the carry over.

1 ten + 2 tens + 3 tens + 1 ten(carry over)

= 7 tens. Write 7 under tens column.

Ans. 72

B. Regrouping tens into Hundreds and Tens:

EXPLANATION

While adding ,if the tens exceed 10, we take ten tens to the hundreds ' place as one hundred and write the remaining tens at the tens place. This method of addition is known as regrouping or carry over.

● FOR EXAMPLE:

Add 65 and 75.

Step 1: Add the ones together.

H T O

5 ones + 5 ones = 10 ones, 10 ones = 1 ten + 0 ones

$$\underline{65}$$

Write 0 under ones' column and carry over 1 ten to the tens column.

$$+ \underline{75}$$

14 0 **Step 2:** Add the tens together.

6 tens + 7 tens + 1 ten(carry over) = 14 tens

14 tens = 10 tens + 4 tens

= 1 hundred + 4 tens

Write 4 under tens' column and carry over 1 hundred to the hundreds' column.

Step 3: As there is nothing to add in the hundreds' column write 1 as it is.

5.Addition of a 1-digit or a 2-digit Number to a 3-digit Number (With carry over)

EXPLANATION

For the addition of a 1-digit or a two digit number to a 3-digit number with carry over, let us consider the numbers 567 and 5.i.e 7 ones + 5 ones = 12 ones, carry 1 ten to the tens column and write 2 under ones' column. Now add the tens digits together along with the carry over and write the sum under the tens column i.e 6 tens + 1 ten = 7 tens, write 7 under tens column. As there is nothing to add in hundreds' column, write 5 under hundreds' column.

● FOR EXAMPLE:

1. H T O

$$\begin{array}{r} 5 \quad 67 \\ + \quad 5 \\ \hline 572 \end{array} \quad \begin{array}{l} 7 + 5 = 12 \\ 6 + 1 = 7 \end{array}$$

2. Add 786 and 47.

H T O

$$\begin{array}{r} 7 \quad 86 \\ + \quad 47 \\ \hline 833 \end{array} \quad \begin{array}{l} 6 + 7 = 13 \\ 8 + 4 = 12 + 1 = 13 \\ 7 + 1 = 8 \end{array}$$

6. Addition of Two 3-digit numbers:

EXPLANATION

- * For the addition of two 3-digit numbers, add the ones together and write the sum below ones column.
- * Add the tens together and write the sum below tens column .
- * Add the hundreds together and write the sum below hundreds column.

● **FOR EXAMPLE:**

1. Add 231 and 434.

H	T	O
2	3	1
+	4	3
<hr/>		
6	6	5

1 one + 4 ones = 5 ones

3 tens + 3 tens = 6 tens

4 hundreds + 2 hundreds = 6 hundreds

2. Add 468 and 375.

H	T	O
4	6	8
+	3	7
<hr/>		
8	4	3

8 ones + 5 ones = 13 ones

= 1 ten + 3 ones

6 tens + 7 tens + 1 ten(carry over) = 14 tens

$$14 \text{ tens} = 10 \text{ tens} + 4 \text{ tens}$$

$$= 1 \text{ hundred} + 4 \text{ tens}$$

$$4 \text{ hundreds} + 3 \text{ hundreds} + 1 \text{ hundred(carry over)} = 8 \text{ hundreds}$$

7. Addition of Three 3-digit Numbers

EXPLANATION

- * While adding Three 3-digit Numbers first we add the ones column and if it is more than 9 ones or if the sum is a 2-digit number we write the right side digit under ones column and carry the tens digit to the tens column to add with it.
- * Then we add the tens column with the number carry over. Similarly if the sum is more than one digit, we write the right side digit under hundreds column and carry the left side digit to the hundreds column add and write the answer.

● FOR EXAMPLE:

1. Add 134, 354 and 446

H	T	O	4 ones + 4 ones + 6 ones = 14 ones
1	1		14 ones = 10 ones + 4 ones = 1 ten + 4 ones
134			(carry 1 ten to the tens column & write 4 ones under ones column).
354			
+	446	3 tens + 5 tens + 4 tens + 1 ten(carry over) = 13 tens	
934			13 tens = 10 tens + 3 tens = 1 hundred + 3 tens(carry 1 hundred to the hundreds column and write 3 under tens column).
			1 hundred + 3 hundreds + 4 hundreds +1 hundred(carry over) = 9 hundreds(write 9 under hundreds column)

Ans. 934

8. Word Problems

EXPLANATION

Read the problem carefully.Understand clearly what is given and what is asked for.Write the steps clearly and then solve the problem.

● **FOR EXAMPLE:**

1. A fruit seller sold 264 apples, 210 oranges and 315 mangoes.How many fruits did he sell altogether?

Solution: Read the question carefully.

Think what is given in the question.

YES ! Number of different fruits sold by a fruit seller.

What are asked to find out?

Total number of fruits sold by the fruit seller.

How can we find this out ?By adding.

Number of apples sold = 264

Number of oranges sold = 210

Number of mangoes sold = 315

Total number of fruits sold = 789

H	T	O
2	6	4

+	3	1	5
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7	8	9
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Ans. 789

MIND MAP

