Chapter- 4

SUBTRACTION

STUDY NOTES

* **Subtraction of a 3-digit Number from a 3-digit Number and 4-digit Numbers (without regrouping)**
* **Subtraction of a 3-digit Number from a 3-digit Number , 4-digit Numbers and 5-digit Numbers (with regrouping)**
* **Word problems**
* **Estimation**
* **Relationship Between Addition and Subtraction**
* **Sums Involving Both Addition and Subtraction**
* **Word Problems Involving Both Addition and Subtraction**

1. Subtraction of a 3-digit Number from a 3-digit Number and 4-digit Numbers (without carry over)

EXPLANATION

The subtraction means the process or skill of taking one number or amount away from another. The operation or process of finding the difference between two numbers or quantities, denoted by a minus sign (−). Subtraction is typically the second operation you learn in arithmetic, after addition.

3-DIGIT NUMBERS →

Think of a 3-digit number, say 853 and then think of another 3-digit number, say 421. Now think which number is bigger. Write the bigger number first and the other number below the bigger number and then subtract.

➢ **For example:**

1)
$$\begin{array}{r} 8\ 5\ 3 \\ -\ 4\ 2\ 1 \\ \hline 4\ 3\ 2 \end{array}$$

3 - 1 = 2
5 - 2 = 3
8 - 4 = 4

REMEMBER

A bigger number can never be subtracted from a smaller number.

➢ **For example:**

1)
$$\begin{array}{r} 7\ 8\ 5\ 3 \\ -\ 2\ 5\ 1\ 3 \\ \hline 5\ 3\ 4\ 0 \end{array}$$

3 - 3 = 0
5 - 1 = 4
8 - 5 = 3
7 - 2 = 5

4-DIGIT NUMBERS →

Think of two 4-digit numbers say 6785 and 3241.We have subtracted 3-digit number up to hundreds place and similar way the thousands place on the left side of the hundreds place will be subtracted in 4-digit numbers. As already we have learned how to subtract a smaller from a greater number i.e to find the difference between the numbers.

Subtract the following:

2)

$$\begin{array}{r} 6\ 7\ 8\ 5 \\ -\ 3\ 2\ 4\ 1 \\ \hline \end{array}$$

Steps to be followed:

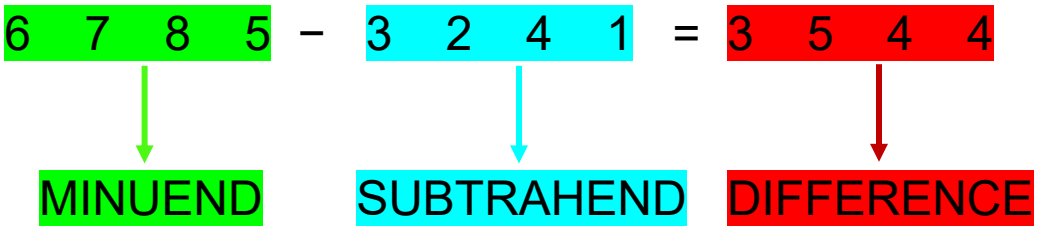
1.Subtract the ones. Write 4 in the ones column. **5 – 1 = 4**

2.Subtract the tens. Write 4 in the tens column. **8 – 4 = 4**

3.Subtract the hundreds. Write 5 in the hundreds column. **7 – 2 = 5**

4.Subtract the thousands. Write 3 in the thousands column. **6 – 3 = 3**

$$\begin{array}{r} 6\ 7\ 8\ 5 \\ -\ 3\ 2\ 4\ 1 \\ \hline 3\ 5\ 4\ 4 \end{array}$$



2. Subtraction of a 3-digit Number from a 3-digit Number, 4-digit Numbers and 5-digit Numbers (with carry over)

3-DIGIT NUMBERS

Think of a 3-digit number, say 854 and then think of another 3-digit number, say 258. Now let us subtract. Write one number below the other and then subtract. We always subtract smaller number from bigger number. At first we have to subtract the ones place i.e.

4 – 8 , as 4 is smaller we cannot subtract 8 from it. So, we have to borrow 1 from tens place to make 4 as 14 ones and then we subtract 14 – 8 = 6. As we had borrowed 1 ten to ones place, the tens place becomes 5 – 1 = 4. Again, we have to borrow 1 from hundreds place to make 4 as 14 tens as 4 < 5, then we subtract

14 – 5 = 9. As we had borrowed 1 hundred to tens place, the hundreds place becomes 8 – 1 = 7. Now in hundreds place we subtract 7 – 2 = 5 as 7 > 2.

➢ **For example:**

```
  7  14  14
  8   5   4
- 2   5   8
-----------
  5   9   6
```

4 + 10 = 14 − 8 = 6
5 – 1 = 4, 4 + 10 = 14 – 5 = 9
8 – 1 = 7 − 2 = 5

2)

```
  4  12  10
  5   3   0
- 3   6   8
-----------
  1   6   2
```

0 + 10 = 10 − 8 = 2
3 – 1 = 2, 2 + 10 = 12 – 6 = 6
5 – 1 = 4 − 3 = 1

REMEMBER

In subtraction, if the digit on the bottom is greater than the one on top, regrouping is necessary. It means to subtract a bigger digit from a smaller digit, we have to regroup or borrow from the column to the left.

➢ **For example:** **Subtract 2965 from 7843**

Solution :

```
  Th  H   T   O
   6  17  13  13
   7   8   4   3
-  2   9   6   5
-----------------
   4   8   7   8
```

Lets see the steps

STEP 1 Subtract the ones : Since 5 > 3, borrow 1 ten from the tens place. Change 1 ten to ten ones. So we have 4 – 1 = 3 tens and 13 ones : 13 - 5 = 8

STEP 2 Subtract the tens : since 6 > 3, change 1hundred to ten tens. Borrow 1 ten. So we have 8 – 1 = 7 hundreds and 13 tens ; 13 - 6 = 7

STEP 3 Subtract the hundreds, since 9 > 7 , change 1 thousand to 10 hundreds. So we have 7 – 1 = 6 thousands and 17 hundreds: 17 - 9 = 8

STEP 4 Now subtract the thousands: 6 - 2 = 4

So, the answer is 4 8 7 8.

3. Word problems

EXPLANATION

First read the sum properly and try to understand what is asked to do. There are some special words that are associated with subtraction, the words are - " left, remained, take away, how many more, less than, fewer than " etc. Then read the first sentence and try to frame first statement. Similar, way the second and subtract to find the difference. After completion write the final statement that gives the answer to the story sum. After completion use the Therefore sign and ∴ write the statement that gives the answer to the end question of the story sum.

For example:

Q. A milkman carried 4827 bottles of milk in his truck. 2590 bottles broke. How many bottles remained?

Solution:

		7 12
Number of milk bottles carried	=	4 ~~8~~ ~~2~~ 7
Number of milk bottles broke	= −	2 5 9 0
Number of milk bottles remained	=	2 2 6 7

∴ **2267 milk bottles remained.**

4. Estimation

EXPLANATION

Estimate means to find something close to the correct answer. Estimation of numbers is the process of approximating or rounding off the numbers in which the value is used for some other purpose in order to avoid the complicated calculations.

When it comes to estimating in math, there is a general rule for you to follow. This general rule tells you to look at the digit to the right of the digit you want to estimate, and if it is less than 5 then you round down, and if it is greater than 5, you round up.

If it is less than 5, you round down and if it is more than 5, you round up

< 5 **> 5**

Rules to round off a number to the nearest 10

*** We will consider the ones digit of the given number.**

*** If it is 5 or more, then add 1 (one) to the tens digit and put zero (0) at the ones place.**

*** If the ones digit is less than five (5), put zero (0) at the ones place. No change is made in the tens digit.**

➢ **For example:**

Estimate the following by rounding off to the nearest 10

7362 - 4569

STEP 1 See the number **7362** and round off to nearest **10**

STEP 2 **2** is in the ones place in the number **7 3 6 2**

STEP 3 So, **2 < 5** , we round down **7 3 6 2** to **7 3 6 0**

STEP 4 Now see the other number **4 5 6 9** and round off to nearest **10**

STEP 5 **9** is in the ones place in the number **4 5 6 9**

STEP 6 So, **9 > 5** , we round up **4 5 6 9** to **4 5 7 0**

STEP 7 Now let us subtract **7 3 6 0 - 4 5 7 0**

After rounding off the difference is

7 3 6 0 - 4 5 7 0 = 2 7 9 0

But by actual subtraction we get: 7 3 6 2 - 4 5 6 9 = 2 7 9 3

Thus, estimation varies slightly from the real difference.

Rules to round off a number to the nearest 100

*** We will consider the tens digit of the given number.**

*** If the tens digit is 5 or more, we put zero (0) at the ones and tens place and add 1 (one) to the hundreds digit.**

*** If the tens digit is 5 or less, we put zero (0) at the ones and tens place and no change is made in the hundreds digit and keep as it is.**

➢ **For example:**

Estimate the following by rounding off to the nearest 100

6283 - 2468

STEP 1 See the number **6283** and round off to nearest **100**

STEP 2 **8** is in the tens place in the number **6 2 8 3**

STEP 3 So, **8 > 5** , we round up **6 2 8 3** to **6 3 0 0**

STEP 4 Now see the other number **2 4 6 8** and round off to nearest **100**

STEP 5 **6** is in the tens place in the number **2 4 6 8**

STEP 6 So, **6 > 5** , we round up **2 4 6 8** to **2 5 0 0**

STEP 7 **Now let us subtract 6 3 0 0 - 2 5 0 0**

After rounding off the difference is

6 3 0 0 - 2 5 0 0 = 3 8 0 0

But by actual subtraction we get: 6 2 8 3 - 2 4 6 8 = 3 8 1 5

Thus, estimation varies slightly from the real difference.

Rules to round off a number to the nearest 1000

*** We will consider the hundreds digit of the given number.**

*** If the hundreds digit is 5 or more, we put zero (0) at the ones, tens and hundreds place and add 1 (one) to the thousands digit.**

*** If the hundreds digit is 5 or less, we put zero (0) at the ones, tens and hundreds place and no change is made in the thousands digit and keep as it is.**

➢ **For example:**

Estimate the following by rounding off to the nearest 1000

8734 - 3146

STEP 1 **See the number 8734 and round off to nearest 1000**

STEP 2 **7 is in the hundreds place in the number 8 7 3 4**

STEP 3 So, 7 > 5 , we round up 8 7 3 4 to 9 0 0 0

STEP 4 Now see the other number 3 1 4 6 and round off to nearest 1000

STEP 5 1 is in the hundreds place in the number 3 1 4 6

STEP 6 So, 1 < 5 , we round down 3 1 4 6 to 3 0 0 0

STEP 7 Now let us subtract 9 0 0 0 - 3 0 0 0

After rounding off the difference is

9 0 0 0 - 3 0 0 0 = 6 0 0 0

But by actual subtraction we get: 8 7 3 4 - 3 1 4 6 = 5 5 8 8

Thus, estimation varies slightly from the real difference.

5. Relationship Between Addition and Subtraction

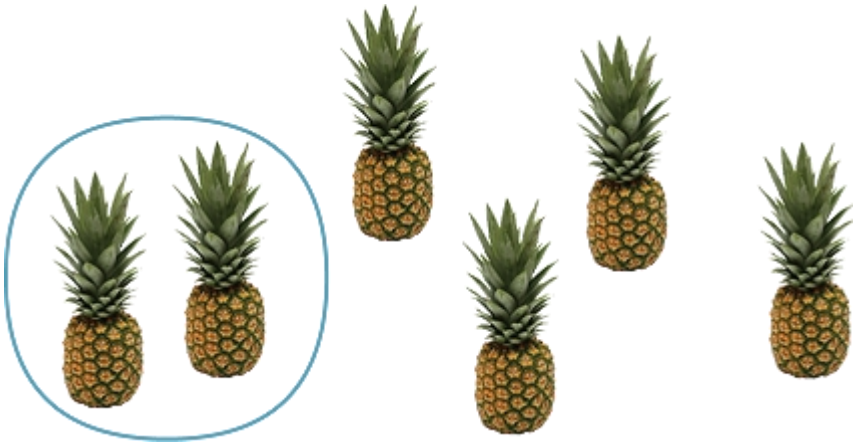
EXPLANATION

Addition and subtraction are opposites. Addition and subtraction are inverse operations because one operation can "undo" the other operation. Addition and subtraction are two of the ways we work with numbers. We call them arithmetical operations.

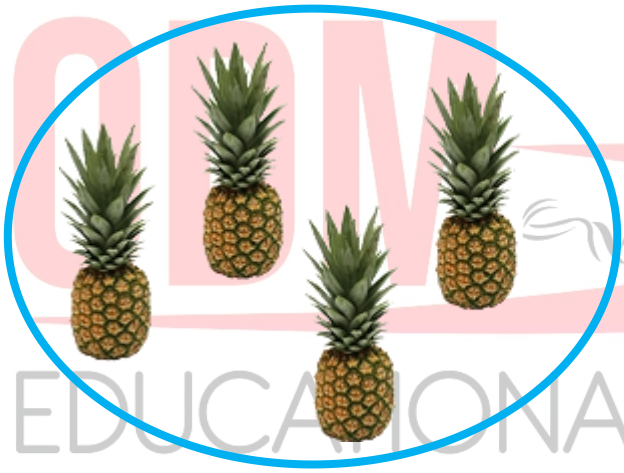
➢ **For example:**

* So we say there are 6 pineapples altogether and we can write 4 + 2 = 6.

* If we start with 6 pineapples and take away 2, we are left with 4. We can write 6 – 2 = 4.



* If we start with 6 pineapples and take away 4, we are left with 2. We can write 6 − 4 = 2.



6. Sums Involving Both Addition and Subtraction

EXPLANATION

•To solve the addition and subtraction sum , add the first number to the number with the '+' sign before it.

•From the sum, subtract the number with the '-' sign before it , to get the correct answer.

➢ **For example:**

Solve: 3424 – 4321 + 3343

	3	4	2	4	Step -1 Add the first number 3424 to 3343
+	3	3	4	3	3424 + 3343 = 6767
	6	7	6	7	Step -2 From the sum 6767 subtract 4321
–	4	3	2	1	6767 – 4321 = 2446
	2	4	4	6	So, 2446 is the required answer.

7. Word Problems Involving Both Addition and Subtraction

EXPLANATION

First read the sum properly and try to understand what is asked to do. We are required to figured out which operation to apply first for the given mixed sum .In general, for the addition and subtraction mixed sum , first we will add two figures and then subtract the third figure from the sum.

➢ **For example:**

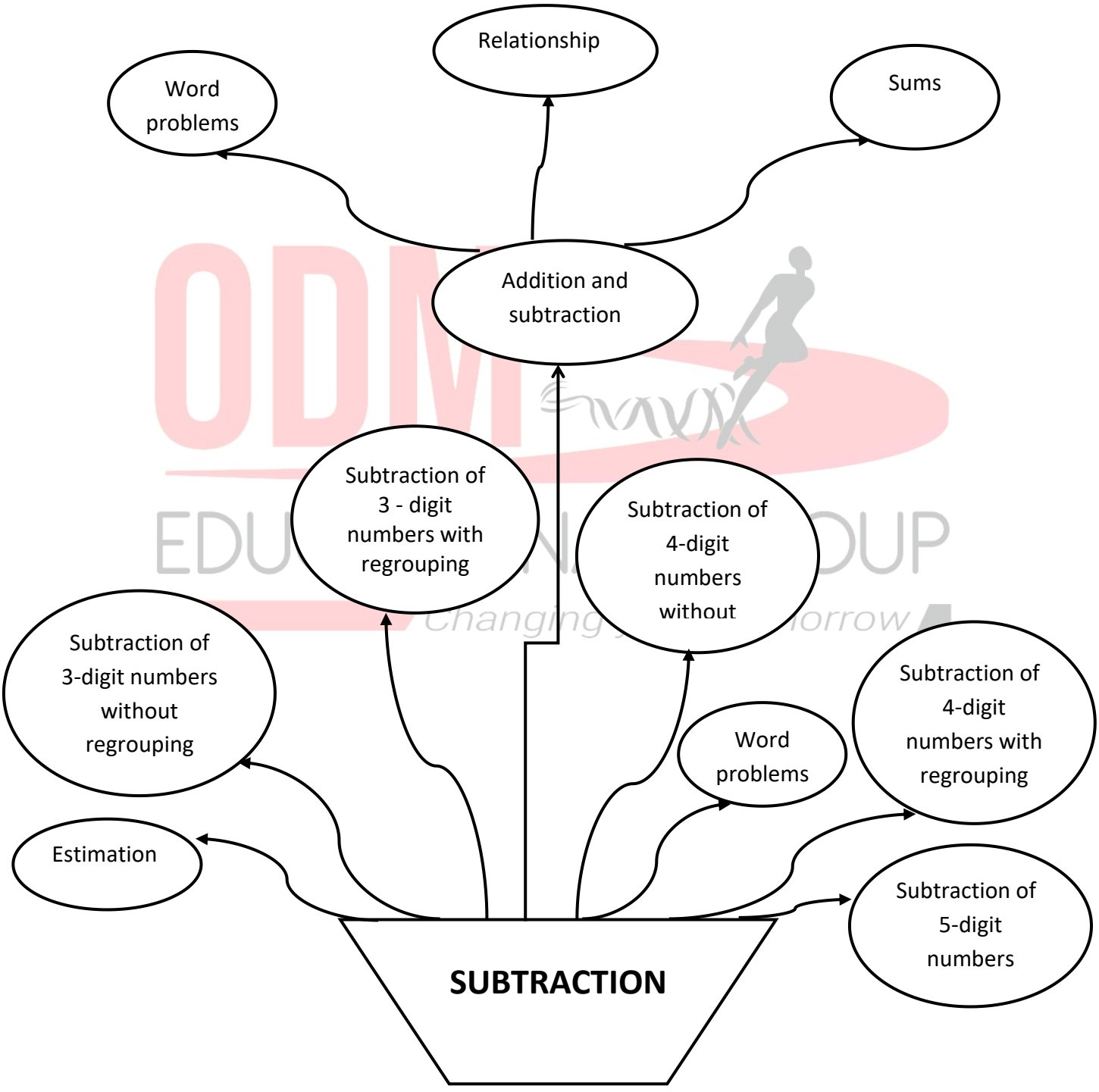
Q. In a forest, there were 1728 pine trees and 2486 other kind of trees. 506 trees fell in a storm. How many trees remained standing?

Solution:

Number of pine trees in the forest	=	1 7 2 8
Number of other kind of trees	=	+ 2 4 8 6
Total number of trees in the forest	=	4 2 1 4
		3 12 0 14
Total number of trees in the forest	=	~~4 2 1 4~~
Number of trees fell in the storm	= –	5 0 6
Trees remained standing	=	3 7 0 8

∴ 3708 trees remained standing in the forest.

MIND MAP


Relationship
Word problems
Sums
Addition and subtraction
Subtraction of 3 - digit numbers with regrouping
Subtraction of 4-digit numbers without
Subtraction of 3-digit numbers without regrouping
Word problems
Subtraction of 4-digit numbers with regrouping
Estimation
Subtraction of 5-digit numbers
SUBTRACTION