

4. Subtraction



Revision

- (1) There are 452 teak trees and 321 neem trees in a forest. How many more neem trees must be planted in order to have the same number of neem trees as teak trees?

$$\begin{array}{r} 452 \\ - 321 \\ \hline 131 \end{array}$$

In order to find the answer, we have to count ahead from 321 to 452.
In other words, we have to subtract 321 from 452.
131 more neem trees have to be planted.

- (2) Ajay has collected 207 seeds while Vijay has collected 165 seeds. How many more seeds does Ajay have than Vijay ?

We can find the answer by doing the following subtraction: $207 - 165$.

T	H	U
1	10	
2	0	7
1	6	5
0	4	2

Let us subtract 5 units from 7 units. 2 remain.

We cannot subtract 6 tens from 0 tens. However, we have 2 hundreds of which we can borrow 1.

1 hundred remains in the hundreds place.

1 hundred is equal to 10 tens. Write them in the tens place. Subtracting 6 tens from 10 tens, 4 tens remain.

Now, subtract 1 hundred from 1 hundred, 0 remain.

The answer is 42.

Ajay has 42 more seeds than Vijay.

Exercise

- Arrange vertically and subtract.
 - $586 - 425$
 - $465 - 179$
 - $542 - 351$
 - $754 - 287$
 - $500 - 365$
 - $502 - 307$
- If $400 - 100 = 300$, solve $477 - 177$. Write three subtraction problems with the answer 200.
- Rajani buys a uniform worth ₹372 and a school bag worth ₹250. How much more does she spend on the uniform than on the bag ?
- The answer to an addition is 915. One of the numbers is 427. Which is the other number ?
- The answer to an addition is 915. Choose any number smaller than 800 as one of the numbers. Find the other number.
- Using the numbers 534 and 252, write a subtraction word problem and solve it.

Subtraction of four-digit numbers without borrowing

- ◆ There are 4526 men and 3214 women in a village. How many more men than women does the village have?

Th	H	T	U
4	5	2	6
– 3	2	1	4
1	3	1	2

We shall subtract four-digit numbers using the same method that we used to subtract three-digit numbers.

There are 1312 more men than women.

- ◆ **Subtract horizontally.**

$$\begin{array}{r} \text{Th H T U} \\ 6 \ 7 \ 8 \ 9 \end{array} - \begin{array}{r} \text{Th H T U} \\ 5 \ 4 \ 3 \ 2 \end{array} = 1357$$

Even horizontally, units are subtracted from units, tens from tens, hundreds from hundreds and thousands from thousands.

Exercise

1. Subtract the following.

(1)

5	6	0	0
– 2	3	0	0

(2)

5	7	9	5
– 1	8	0	

(3)

2	5	8	9
– 1	3	5	4

2. Arrange horizontally and subtract.

(1) $5555 - 2222$

(2) $8740 - 3520$

(3) $9586 - 432$

(4) $3256 - 24$

3. If $5000 - 2000 = 3000$, then $5888 - 2888 = ?$

4. Write three subtraction problems with the answer 2000.

5. Using the words 'literate' and 'illiterate' and the numbers 4765 and 2142, write a subtraction problem and solve it.

6. Whose subtraction is correct? Why?

Manda

5	6	8	7
–	2	5	
5	4	3	7

Nanda

5	6	8	7
– 2	5		
3	1	8	7

Kunda

5	6	8	7
–		2	5
5	6	6	2

Subtraction by borrowing

(1) Let us solve : $9072 - 7548$.

Th	H	T	U
8	10	6	12
9	0	7	2
- 7	5	4	8
1	5	2	4

First we write the numbers vertically. We cannot subtract 8 units from 2 units. Therefore, we untie 1 ten from 7 tens. 6 tens remain in the tens place. 10 units from 1 ten plus 2 units make 12 units. $12 - 8 = 4$ units.

$6T - 4T = 2T$. 2 tens remain in the tens place.

We cannot subtract 5 hundreds from 0 hundreds.

Therefore, we untie 1 thousand from 9 thousands. 8 remain in the thousands place. 1 thousand equals 10 hundreds. 10 hundreds plus 0 hundreds make 10 hundreds.

$$10H - 5H = 5H.$$

$8Th - 7Th = 1Th$. The answer is 1524.

(2) Solve : $5000 - 967$

Th	H	T	U
	9	9	
4	0	0	10
5	0	0	0
-	9	6	7
4	0	3	3

Here, we cannot subtract 7 units from 0 units. We must untie 1 ten. However, there are no numbers in the tens and hundreds places. Therefore, we will untie 1 thousand from the 5 thousands and obtain 10 hundreds. Then we untie 1 hundred from 10 and we obtain 10 tens. There are 9 hundreds left in the hundreds place. Of the 10 tens, we untie 1 ten. We get 10 units and 9 tens will remain in the tens place.

We write the units in the units column. $10U - 7U = 3U$; $9T - 6T = 3T$; $9H - 9H = 0H$; there is nothing to subtract from 4 thousands. The answer is 4033.

Exercise

1. Subtract.

(1)

Th	H	T	U
4	2	1	5
- 2	6	4	9

(2)

Th	H	T	U
7	1	2	3
- 5	7	8	4

(3)

Th	H	T	U
3	0	1	4
- 2	5	2	7

(4)

Th	H	T	U
6	3	2	5
-	7	5	8

2. Arrange vertically and subtract.

(1) $3245 - 1127$

(2) $6007 - 2345$

(3) $6037 - 4043$

(4) $4752 - 2384$

(5) $4004 - 3156$

(6) $8042 - 3129$

(7) $6524 - 2656$

(8) $5305 - 2169$

(9) $6052 - 2763$

(10) $8235 - 4192$

(11) $4000 - 3999$

(12) $8020 - 5432$

Subtraction of five-digit numbers without borrowing

◆ In a village, ₹ 86,574 are collected through contributions for water conservation works. ₹ 74,254 are spent. The remaining amount is to be used for ground water recharging. How much money remains for this work ?

TTh	Th	H	T	U
8	6	5	7	4
- 7	4	2	5	4
1	2	3	2	0

Arrange the numbers in order, putting units under units, tens under tens, and so on.

Units are subtracted from units, tens from tens, hundreds from hundreds, thousands from thousands and ten thousands from ten thousands.

₹ 12,320 are available for ground water recharging.

Exercise

1. Subtract.

(1)

TTh	Th	H	T	U
1	7	4	3	2
- 1	4	3	2	1

(2)

TTh	Th	H	T	U
3	4	5	6	7
- 1	3	2	5	6

(3)

TTh	Th	H	T	U
5	9	3	2	5
- 3	7	1	2	4

(4)

TTh	Th	H	T	U
3	8	9	7	6
- 2	7	4	0	5

2. Arrange vertically and subtract.

(1) $13908 - 2705$

(2) $23457 - 346$

(3) $85679 - 74056$

(4) $69876 - 54321$

Subtraction of five-digit numbers by borrowing

◆ Study the following example.

TTh	Th	H	T	U
	14	9	9	
3	4	10	10	15
3	7	8	5	7
0	7	1	4	8

We cannot subtract 7 units from 5 units. Therefore, we need to untie 1 ten. Since there is nothing in the tens and hundreds places, we take 1 thousand from 5 thousands and obtain 10 hundreds. We borrow 1 hundred from 10 hundreds and get 10 tens. Borrowing 1 ten from 10 tens gives us 10 units. These 10 units, in addition to 5 units already there, brings the total to 15 units. We subtract 7 units from 15 units and complete the subtraction of the other digits in the proper order.

Exercise

Subtract.

(1)

TTh	Th	H	T	U
4	2	7	1	5
−2	1	6	1	8

(2)

TTh	Th	H	T	U
5	6	8	2	4
−3	2	4	6	5

(3)

TTh	Th	H	T	U
7	8	2	3	5
−4	3	7	5	9

(4)

TTh	Th	H	T	U
3	4	4	2	9
−1	5	2	1	9

(5)

TTh	Th	H	T	U
5	0	7	0	9
−3	2	8	1	5

(6)

TTh	Th	H	T	U
6	7	0	0	0
−3	8	7	6	5

(7)

TTh	Th	H	T	U
5	0	0	0	0
−3	5	0	0	0

(8)

TTh	Th	H	T	U
8	4	5	4	0
−2	4	8	9	9

(9)

TTh	Th	H	T	U
7	0	0	0	0
−1	9	0	7	5

Addition and subtraction : Oral

- Tai** : Medha, Kunal, Johnathan, come here. Let's play a different game today. One of you will tell two numbers. The other two will add and subtract them. But, you must not use a pencil or a notebook.
- Medha** : Does that mean we have to solve them mentally or orally?
- Tai** : Yes. Johnathan, you may begin.
- Johnathan** : 28 and 53.
- Kunal** : The sum is 81. Because 28 and 3 equal 31. Then we add 50 to 31. This means we add 5 times 10 to 31. So, 41, 51, 61, 71, 81.
- Medha** : I solved it differently. I added 2 tens from 28 and 5 tens from 53. That gave 7 tens. The remaining 8 units and 3 units equal 11. This is added to 7 tens or 70. So, $70 + 10 + 1 = 81$.
- Johnathan** : I used still another method. The nearest ten to 28 is 30. I added those, 10 at a time, to 53. 63, 73, 83. Since 30 is 2 more than 28, I subtracted 2. The answer is 81.
- Tai** : Excellent! Now let us try to subtract those two numbers.
- Medha** : I thought in reverse. I went backwards from 53 to 28. How many numbers do I need to go back, to reach 28? That would be the answer. I subtracted 3 from 53, leaving 50. Then I subtracted 2 tens, leaving 30. Then I subtracted 2 and was left with 28. This means I subtracted 3, 10, 10, 2; that is 25 altogether. Therefore, $53 - 28 = 25$.
- Kunal** : Subtracting 28 from 53 means counting forward from 28 to 53. 2 added to 28 equals 30. 20 added to 30 equals 50. 3 more added to 50 equals 53. This means that we added 2, 20 and 3, that is 25, to 28, to get 53. Therefore, $53 - 28 = 25$.
- Tai** : Excellent! All your methods of mental and oral addition and subtraction are absolutely correct. Do continue to add and subtract using your own methods. It will be very useful in the future.

Exercise

Add and subtract the following pairs of numbers orally, using your own methods. If your friend's method is different, try to understand it.

(1) 90, 50

(2) 35, 65

(3) 47, 23

(4) 16, 74

(5) 70, 38