CLASS - VI

CHAPTER – 2

Module – 1/3

WHOLE NUMBERS

1. Introduction:

Natural numbers:

As we know that counting numbers are called Natural numbers. We use 1, 2, 3, 4, ... when we begin to count. They come naturally when we start counting.

Predecessor and successor

If we add 1 to a natural number, we get its successor. If we subtract 1 from a natural number, we get its predecessor.
The successor of 16 is 16 + 1 = 17, that of 19 is 19 +1 = 20 and so on.

The number 16 comes before 17, we say that the predecessor of 17 is 17–1=16, the predecessor of 20 is 20 – 1 = 19, and so on.

The number 3 has a predecessor and a successor. What about 2? The successor is 3 and the predecessor is 1. Does 1 have both a successor and a predecessor?

2. Whole Numbers

Every natural number has a successor. Every natural number except 1 has a predecessor. We have seen that the number 1 has no predecessor in natural numbers. To the collection of natural numbers we add zero as the predecessor for 1.

If we add the number zero to the collection of natural numbers, we get the collection of whole numbers. Thus, the numbers 0, 1, 2, 3,... form the collection of whole numbers.
Every whole number has a successor. Every whole number except zero has a predecessor.

All natural numbers are whole numbers, but all whole numbers are not natural numbers.

3. The Number Line

We take a line, mark a point on it and label it 0. We then mark out points to the right of 0, at equal intervals. Label them as 1, 2, 3,.... Thus, we have a number line with the whole numbers

represented on it. We can easily perform the number operations of addition, subtraction and multiplication on the number line.

The distance between these points labelled as 0 and 1 is called unit distance. On this line, mark a point to the right of 1 and at unit distance from 1 and label it 2. In this way go on labelling points at unit distances as 3, 4, 5,... on the line. You can go to any whole number on the right in this manner.

This is a number line for the whole numbers.

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├──┼──┼──┼──┼──┼──┼──┼──┼──┼──┼──►
0    1    2    3    4    5    6    7    8    9    10
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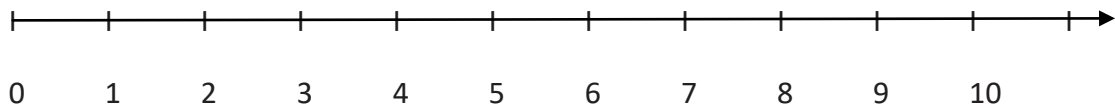
What is the distance between the points 2 and 4? Certainly, it is 2 units. Can you tell the distance between the points 2 and 6, between 2 and 7?

On the number line you will see that the number 7 is on the right of 4. This number 7 is greater than 4, i.e. 7 > 4. The number 8 lies on the right of 6 and 8 > 6. These observations help us to say that, out of any two whole numbers, the number on the right of the other number is the greater number. We can also say that whole number on left is the smaller number.

For example, 4 < 9; 4 is on the left of 9. Similarly, 12 > 5; 12 is to the right of 5.

What can you say about 10 and 20?

Mark 30, 12, 18 on the number line. Which number is at the farthest left? Can you say from 1005 and 9756, which number would be on the right relative to the other number.

Place the successor of 12 and the predecessor of 7 on the number line.

4. Addition on the number line

Addition corresponds to moving to the right on the number line. Addition of whole numbers can be shown on the number line. Let us see the addition of 3 and 4.
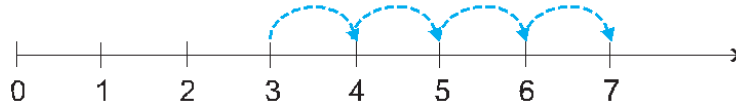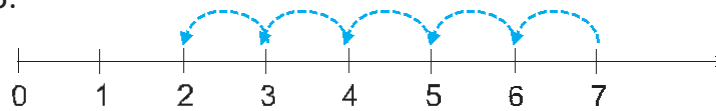
Start from 3. Since we add 4 to this number so we make 4 jumps to the right; from 3 to 4, 4 to 5, 5 to 6 and 6 to 7 as shown above. The tip of the last arrow in the fourth jump is at 7.

The sum of 3 and 4 is 7, i.e. 3 + 4 = 7.

5. Subtraction on the number line

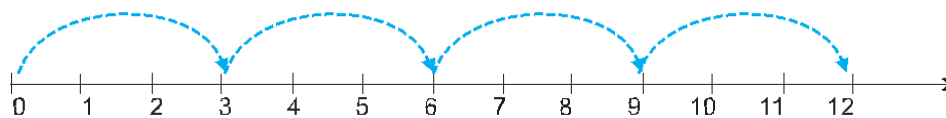The subtraction of two whole numbers can also be shown on the number line.

Let us find 7 – 5.

Start from 7. Since 5 is being subtracted, so move towards left with 1 jump of 1 unit. Make 5 such jumps. We reach the point 2. We get 7 – 5 = 2.

6. Multiplication on the number line

We now see the multiplication of whole numbers on the number line.

Let us find 3 × 4.

Start from 0, move 3 units at a time to the right, make such 4 moves. Where do you reach? You will reach 12. So, we say, 3 × 4 = 12.

EXERCISE – 1

1. Find 4 + 5; 2 + 6; 3 + 5 and 1+6 using the number line.

2. Find 8 – 3; 6 – 2; 9 – 6 using the number line.

3. Write the successor of : (a) 2440701 (b) 100199 (c) 1099999 (d) 2345670

4. Write the predecessor of : (a) 94 (b) 10000 (c) 208090 (d) 7654321

5. Find : 7 + 18 + 13; 16 + 12 + 4

6. Smallest whole number

    (a) 0   (b) 1   (c) 2   (d) -1

7. (I) All natural numbers are also whole numbers

    (II) One is the smallest natural number

    (a) only I is true   (b) only II is true   (c) both are true   (d) both are false

8. The natural numbers along with zero form the collection of

    (a) Whole numbers   (b) Integers   (c) Rational numbers (d) Real numbers

9. Predecessor of which two digit number has a single digit

    (a) 9   (b) 10   (c) 0   (d) 11

10. Which natural number has no predecessor

    (a) 0   (b) 1   (c) 10   (d) 100

11. Whole numbers are closed under which operation

    (a) Addition   (b) Subtraction   (c) Division   (d) None of these

12. Which number is identity for Addition of whole number

    (a) 0   (b) 1   (c) 10   (d) 100

13. Which number is identity for multiplication of whole numbers:

    (a) 0   (b) 1   (c)10   (d) 100

14. Smallest whole number is

    (a) 0   (b) 1   (c) 2   (d) -1

15. Predecessor of which two digit number has a two digit

    (a) 99   (b) 100   (c) 101   (d) 111

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