INTEGERS

Introduction

The first numbers to be discovered were Natural numbers:- 1,2,3,4,…

If we include zero to the collection of natural numbers, we get a new collection of numbers known as Whole numbers.

ie. 0,1,2,3…

We have studied whole numbers and operations of addition, subtraction, multiplication and division on them.

If we subtract a whole number from another whole number, the difference may not always be a whole number. We have no whole number to represent 12-19 or 16- 37 . So there is a need to extend our number system so that we have numbers to represent such numbers. Corresponding to natural numbers 1,2,3,4....   we create new numbers -1,-2,-3,-4 called minus1, minus2 , minus3,minus4 such that

1+(-1)=0

2+(-2)=0

3+(-3)=0 and so on

-1,-2,-3... are called negative numbers.

Combining these negative numbers with whole numbers, we obtain a new collection of numbers which is written as …..-4,-3,-2, -1, 0,1,2,3,4… .

These numbers are called Integers.

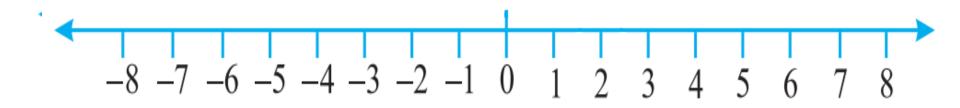The numbers 1,2,3,4… are called positive integers.

The numbers -1,-2,-3… are called negative integers.

The number 0 is an integer. It is neither positive nor negative.

Representation of Integers on a number line.
Draw a line and mark some points at <u>equal</u> distance on it as shown in the figure. Mark a point as zero on it. Points to the right of zero are positive integers and are marked 1,2,3 etc. Points to the left of zero are negative integers and are marked -1,-2,-3 etc.

$$-8 \quad -7 \quad -6 \quad -5 \quad -4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8$$

On a number line the number increases as we move to the right and decreases as we move to the left.
Therefore -3<-2,   -2<-1, -1<0, 0<1, 1<2,   2<3   so on.

From the number line we can see
1) Every positive integer is greater than every negative integer.
2) Zero is smaller than every positive integer.
3) Zero is greater than every negative integer.
4)Farther a number from zero on the right, larger is its value.
5) Farther a number from zero on the left, smaller is its value.

Compare the following numbers
15…… 25
-15…….-25
5 ….. 3
-5……-3
Answers: 15 < 25
          -15 > -25
            5 > 3
           -5 < -3

<u>Tag with a sign</u>

150m above sea level-   +150m

125m below sea level-   -125m

25^oC above 0^oC - $+25^oC$

25^oC below 0^oC - -25^oC

 gain of Rs 800   + Rs 800

Write the opposites of the following

 a deposit of Rs 20 000 : Withdrawal of Rs 20 000

  covid 19 positive   : covid 19 negative

Earning money   : spending money

36   : -36

-25   : + 25