

Subject- Maths Chapter- Integers

INTRODUCTION TO INTEGERS

We know that in numbers, when a smaller whole number is subtracted from a larger one, we get a whole number.

But, what about 3, -5, 5, -8, 11, -16 etc?

Corresponding to natural numbers 1, 2, 3, 4, 5, 6... we introduce new numbers denoted by -1, -2, -3, -4... called minus one, minus two, minus three, minus four... respectively such that $1 + (-1) = 0$, $2 + (-2) = 0$, $3 + (-3) = 0$ and so on.

We say that

-1 and 1 are the opposites of each other.

-2 and 2 are the opposites of each other.

Thus, our new collection together with whole numbers becomes

$\dots, -3, -2, -1, 0, 1, 2, 3, \dots$

These numbers are called integers

The numbers $1, 2, 3, 4, 5, \dots$ are called positive integers, the numbers $-1, -2, -3, -4, -5, \dots$ are called negative integers and 0 is an integer which is ~~neig~~ neither positive nor negative.

ABSOLUTE VALUE OF AN INTEGER

The absolute value of an integer is the numerical value of the integer regardless of its sign

The absolute value of -2 , written as $|-2|$, is 2 .

The absolute value of -5 , written as $|-5|$, is 5 .

Q1- Write the opposite of each of the following:

- (i) An increase of 8
- (ii) A loss of ₹ 7
- (iii) Gaining a weight of 5 Kg.
- (iv) Earning ₹ 500
- (v) Going 6 m to the east.
- (vi) 24
- (vii) -34

Q2. Indicate the following using '+' or '-' sign:

- (i) A gain of ₹ 600
- (ii) A loss of ₹ 800
- (iii) 7°C below the freezing point
- (iv) Decrease of 9
- (v) A deposit of ₹ 200
- (vi) A withdrawal of ₹ 300

Q3. Find the value of

- (i) $| -9 |$
- (ii) $| -36 |$
- (iii) $| 0 |$
- (iv) $| 15 |$
- (v) $| -3 |$
- (vi) $7 + | -3 |$

PROPERTIES OF ADDITION ON INTEGERS

(i) CLOSURE PROPERTY OF ADDITION The sum of two integers is always an integer.

EX - (i) $3+5=8$, and 8 is an integer.

(ii) $3+(-8)=-5$, and -5 is an integer.

(iii) $(-3)+(-9)=-12$, and -12 is an integer.

(ii) COMMUTATIVE LAW OF ADDITION If a and b are any two integers then $a+b=b+a$

EX - $(-3)+8=5$, and $8+(-3)=5$

$$\therefore (-3)+8=8+(-3)$$

(iii) ASSOCIATIVE LAW OF ADDITION If a, b, c are any three integers then

$$(a+b)+c=a+(b+c)$$

EX - Consider the integers -5, -7 and 3.

We have: $[(-5)+(-7)]+3=(-12)+3=-9$

And

$$(-5)+[(-7)+3]=(-5)+(-4)=-9$$

$$\therefore [(-5)+(-7)]+3=(-5)+[(-7)+3]$$

Q4. Fill in the blanks:

$$(i) (-3) + (-9) = \dots \quad (ii) (-7) + (-8) = \dots$$

$$(iii) (-9) + 16 = \dots \quad (iv) (-13) + (25) = \dots$$

$$(v) (8) + (-17) = \dots \quad (vi) 2 + (-12) = \dots$$

Q5. Add

$$\begin{array}{r} -365 \\ -87 \\ \hline \end{array}$$

$$\begin{array}{r} -73 \\ -687 \\ \hline \end{array}$$

$$\begin{array}{r} -1065 \\ -987 \\ \hline \end{array}$$

$$\begin{array}{r} -206 \\ +98 \\ \hline \end{array}$$

$$\begin{array}{r} 178 \\ -69 \\ \hline \end{array}$$

$$\begin{array}{r} -493 \\ +289 \\ \hline \end{array}$$

Q6. Find the sum of

$$(i) 137 \text{ and } -354 \quad (ii) 1001 \text{ and } -13$$

$$(iii) -3057 \text{ and } 199 \quad (iv) -36 \text{ and } 1027$$

$$(v) -389 \text{ and } -1032 \quad (vi) -36 \text{ and } 100$$

Q 7. Write the successor of each one of the following:

(i) 201

(ii) 70

(iii) -5

(iv) -99

(v) -500

Q 8. Write the predecessor of each one of the following:

(i) 120

(ii) 79

(iii) -8

(iv) -141

(v) -300

Q 9. Multiply

(i) 15 by 9

(ii) 18 by -7

(iii) 29 by -11

(iv) -56 by 16

(v) -12 by -9

(vi) -746 by -8

(vii) 118 by -7

(viii) -238 by -143