CHAPTER 2

INTEGERS

(Including Absolute Values and Rules for four fundamental operations on Integers)

2.1 INTEGERS

Integers consist of :

(i) the negatives of all natural numbers, *i.e.* ..... –4, –3, –2, –1

(ii) zero (0).

(iii) natural numbers, *i.e.* 1, 2, 3, 4 .....

Thus, collection of integers

$$I = \{\ldots\ldots, -4, -3, -2, -1, 0, 1, 2, 3, 4, \ldots\ldots\}$$

Negatives of natural numbers — Zero — Natural numbers

Clearly,

(a) 1, 2, 3, 4, 5, etc. are positive integers.

(b) –1, –2, –3, –4, –5, etc. are negative integers.

(c) Zero (0) is neither a positive integer nor a negative integer.

(d) 0, 1, 2, 3, 4, 5, etc. are non-negative integers.

2.2 ABSOLUTE VALUE OF AN INTEGER

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

For example :

The absolute value of $-8 = 8$, the absolute value of $4 = 4$ and so on.

To represent the absolute value of an integer, write the integer in between two vertical line segments (bars).

Thus, absolute value of $-68 = |-68| = 68$,

absolute value of $+47 = |+47| = 47$ and so on.

Therefore, if 'a' represents an integer, its absolute value is represented by $|a|$ and is always non-negative.

1. *The absolute value of a negative number is always greater than the number*
   e.g. Absolute value of $-10 = |-10| = 10$, *which is greater than* -10.
2. *The absolute value of a positive number is always equal to the number itself.*
   e.g. Absolute value of $10 = |10| = 10$
3. *When the absolute value of a number is the number itself, the number under consideration is either zero or positive.*
   e.g. $|0| = 0$, $|5| = 5$, $|16| = 16$ and so on.

Example 1 :

Evaluate :

(i) $|-15|$ (ii) $-|15|$ (iii) $-|-15|$ (iv) $|7| + |-3|$ (v) $|8| - |-6|$

Solution :

(i) $|-15| = 15$ (Ans.)

(ii) Since $|15| = 15$ $\therefore$ $-|15| = -15$ (Ans.)

(iii) Since $|-15| = 15$ $\therefore$ $-|-15| = -15$ (Ans.)

(iv) Since $|7| = 7$ and $|-3| = 3$

$\therefore$ $|7| + |-3| = 7 + 3 = 10$ (Ans.)

(v) Since $|8| = 8$ and $|-6| = 6$

$\therefore$ $|8| - |-6| = 8 - 6 = 2$ (Ans.)

2.3 COMPARING INTEGERS

1. Every positive integer is greater than every negative integer and 0.
2. Every negative integer is smaller than every positive integer and 0.
3. Zero (0) is greater than every negative integer and smaller than every positive integer.
4. Out of two negative integers, the one with the smaller absolute value is greater and the one with greater absolute value is smaller.

For example :

Since absolute value of $-15 = |-15| = 15$

and absolute value of $-23 = |-23| = 23$

$\therefore$ $-15 > -23$ as $|-15| < |-23|$

Similarly, $-65 < -47$ as $|-65| > |-47|$

Example 2 :

Compare the integers :

(i) (–12) and (–15) (ii) (+12) and (–15) (iii) (–12) and (+15)

(iv) (+12) and 0 (v) 0 and (–12).

Solution :

(i) Since (–12) and (–15) are both negative and $|-12| < |-15|$, as $12 < 15$

$\therefore$ $(-12) > (-15)$ (Ans.)

(ii) Since every positive integer is greater than every negative integer,

therefore $(+12) > (-15)$ (Ans.)

(iii) Since every negative integer is smaller than every positive integer,

therefore $(-12) < (+15)$ (Ans.)

(iv) Since every positive integer is greater than zero (0),

therefore $(+12) > 0$ (Ans.)

(v) Since 0 is greater than every negative integer,

therefore $0 > (-12)$ (Ans.)

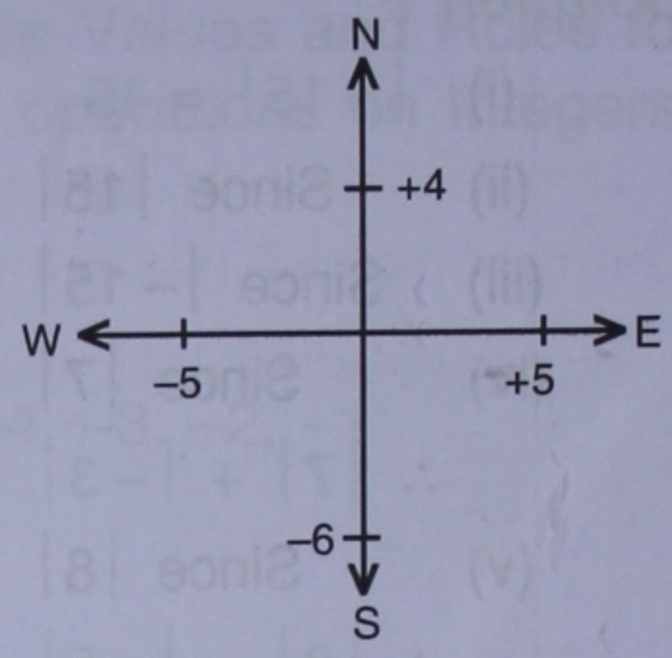
2.4 USE OF INTEGERS AS DIRECTED NUMBERS

Positive and negative integers are together called **directed numbers.**

Directed numbers can be used in several ways.

For example :

1. If moving **5 m towards the East** is represented by **+ 5**, then **– 5** represents **moving 5 m towards the West**, *i.e.* in the opposite direction of **East**.
2. If **+ 4** represents **4 m towards the North**, then **– 6** represents **6 m** towards its opposite direction *i.e.* **towards the South**.



Thus, if a **positive integer** represents **a particular direction,** then **the negative integer** represents **its opposite direction.**

Conversely, if a **negative integer** represents **a particular direction,** the **positive integer** represents **its opposite direction.**

In the same way :

Integers are used to express our day-to-day situations in mathematical terms :

(i) If **profits** are represented by **positive integers**, then **losses** are shown by **negative integers**.

(ii) If **heights above the sea level** are represented by **positive integers**, then **depths below the sea level** are shown by **negative integers**.

(iii) If a **rise in prices** is represented by **positive integers**, then a **fall in prices** is shown by **negative integers** and so on.

(iv) If 5 m above the earth's surface is represented by + 5, then 15 m below the earth's surface is represented by – 15.

(v) If **+ 10** represents **a profit of ₹ 10**, then **– 25** represents **a loss of ₹ 25**.

(vi) If – 56 indicates a giving of ₹ 56, then taking of ₹ 85 is denoted by + 85.

(vii) If a rise in temperature by 32° C is denoted by + 32, then – 15 indicates a fall in temperature by 15° C.

Example 3 :

A man moves 20 m due East and then 16 m due West. Find his position with respect to his starting point.

Solution :

If 20 m due East is represented by + 20, then – 16 represents 16 m due West.

On adding + 20 and – 16, we get :

$$(+ 20) + (- 16) = + 20 - 16$$

$$= + 4, \textit{ which is positive}$$

∴ The position of the man with respect to his starting point is **4 m due East** **(Ans.)**

Example 4 :

The temperature of a body first rises by 25° C and then falls by 32° C. Find the final temperature of the body, if its initial temperature is :

(i) 0° C (ii) 18° C (iii) – 20° C

Solution :

If a **rise in temperature** is denoted **by the positive sign,** then a **fall in temperature** will be denoted **by the negative sign.**

Final temperature = Initial temperature + rise in temperature + fall in temperature.

(i) Final temperature = 0° C + (+ 25° C) + (– 32° C)

= 0° C + 25° C – 32° C = 25° C – 32° C = – 7° C (Ans.)

(ii) Final temperature = 18° C + (+ 25° C) + (– 32° C)

= 18° C + 25° C – 32° C = 43° C – 32° C = 11° C (Ans.)

(iii) Final temperature = – 20° C + (+ 25° C) + (– 32° C)

= – 20° C + 25° C – 32° C = 25° C – 52° C = – 27° C (Ans.)

EXERCISE 2 (A)

1. Fill in the blanks :

(i) Absolute value of +27 is ..... and absolute value of –27 is .....

(ii) $|-16|$ = ..., $|+16|$ = ... and – $|-16|$ = ...

(iii) If absolute value of a number = the number itself; then the number is ..... or .....

2. State ***true*** or ***false*** :

(i) The absolute value of – 3 is 3.

(ii) The absolute value of an integer is always greater than the integer.

(iii) $|+5| = +5$ (iv) $|-5| = -5$

(v) $-|+5| = 5$ (vi) $-|-5| = -5$

3. Evaluate :

(i) $|7|$ (ii) $|-15|$ (iii) $|7-15|$

(iv) $|7| + |-15|$ (v) $|7| - |15|$ (vi) $|15-7|$

4. Evaluate :

(i) $|-7| + |+5| + |0|$ (ii) $|10| - |-15| + |+12|$

(iii) $-|+3| - |-3| + |-6|$ (iv) $|-8| - |17| + |-12|$

5. Compare the integers :

(i) (+28) and (+35) (ii) (–35) and (–28) (iii) (–7) and (+2)

(iv) (+12) and (–12) (v) 0 and (–25) (vi) (–33) and 0

(vii) (+18) and 0.

6. Write the following integers in ascending order of value : –23, 17, –12, 0 and 5.

7. Write the following integers in descending order of value : 17, –6, 12, 0 and –13.

8. Fill in the blanks in each case given below :

	Quantity	Opposite of the quantity
(i)	Profit of ₹ 80	.....
(ii)	Going 50 km towards East	.....
(iii)	.....	Going 60 m below the sea-level.
(iv)	.....	Gaining ₹ 3,250
(v)	.....	Going 37 m due North
(vi)	Losing weight by 4·7 kg	.....
(vii)	A decrease of 23%	.....
(viii)	.....	55% rise in cost.
(ix)	22 m towards left	.....
(x)	.....	17° above 33°.
(xi)	.....	Withdrawing ₹ 235 from a bank
(xii)	Giving ₹ 1,000 to Ramesh	.....

9. If + 100 represents a gain of ₹ 100, what does each of the following represent ?
   (i) – 8 (ii) + 20 (iii) + 36 (iv) – 50

10. If a rise in temperature by 30°C is represented by + 30, what does each of the following represent ?
    (i) + 50 (ii) 0 (iii) – 30 (iv) – 20

11. If walking 80 km towards south is denoted by – 80, what is denoted by ?
    (i) + 20 (ii) – 30 (iii) – 70

12. If 28 m below the earth's surface is given by – 28, state what is given by ?
    (i) – 5 (ii) + 12 (iii) + 34

13. If giving of ₹ 150 is denoted by + 150,
    (i) giving of ₹ 35 will be denoted by ..... (ii) taking of ₹ 78 will be denoted by .....

14. A boy first walks 80 m due north and then 63 m due south. Find his position with respect to his starting point.

15. The temperature of a body first rises by 18°C and then falls by 23°C. Find the final temperature of the body, if its initial temperature is :
    (i) – 30°C (ii) 0°C (iii) 27°C

16. The temperature of a body first falls by 24°C and then rises by 45°C. Find the final temperature of the body, if its initial temperature is :
    (i) – 50°C (ii) 26°C (iii) 5°C

2.5 FOUR FUNDAMENTAL OPERATIONS ON INTEGERS

1. Addition of integers :

(a) *When integers have like signs, i.e. when both the integers which are to be added are either positive or negative.*

Add their absolute values and assign the same sign to the sum.

Example 5 :

Add : (i) + 57 and + 112 (ii) – 32 and – 83.

Solution :

(i) Here, both the integers to be added are positive, and their absolute values are 57 and 112, respectively.

The sum of their absolute values = 57 + 112 = 169

$\therefore$ **(+57) + (+112) = +169** **(Ans.)**

(ii) Here, both the integers to be added are negative, and their absolute values are 32 and 83, respectively.

The sum of their absolute values = 32 + 83 = 115

$\therefore$ **(– 32) + (– 83) = – 115** **(Ans.)**

Thus, on adding two or more positive integers, we always get a positive integer.
Similarly, on adding two or more negative integers, we always get a negative integer.

(b) *When the integers have unlike signs, i.e. one is positive and the other is negative:*

Determine the difference of their absolute values, and to this difference assign the sign of the integer of the greater absolute value.

Example 6 :

Add : (i) + 53 and –29 (ii) – 53 and + 29

Solution :

(i) The absolute values of + 53 and – 29 are 53 and 29 respectively,
and their difference = 53 – 29 = 24.
Since the integer with the greater absolute value is 53, and its sign is +

$\therefore$ **(+ 53) + (– 29) = + 24** **(Ans.)**

(ii) The difference of absolute values = 53 – 29 = 24, and the integer of greater absolute value is 53, with a negative sign.

$\therefore$ **(– 53) + (+ 29) = – 24** **(Ans.)**

Properties of addition of integers :

1. *The addition (sum) of any two integers always gives an integer.*
   e. g., (i) $3 + 8 = 11 \in Z$ (ii) $(-3) + 8 = 5 \in Z$
   (iii) $(-3) + (-8) = -11 \in Z$ (iv) $3 + (-8) = -5 \in Z$ and so on.
2. *For any two integers 'a' and 'b',* $\boldsymbol{a + b = b + a}$.
   e. g. (i) (+3) + (+7) = (+7) + (+3) (ii) (–8) + (+4) = (+4) + (–8)
   (iii) (–6) + (–5) = (–5) + (–6) and so on.

3. *For any three integers 'a', 'b' and 'c',* $a + (b + c) = (a + b) + c$

   e. g. (i) $(-3) + [(2) + (7)] = [(-3) + (2)] + (7)$

   (ii) $18 + [(-5) + (-12)] = [18 + (-5)] + (-12)$ and so on.

4. *For any integer 'a',* $a + 0 = 0 + a = a$

   e. g. (i) $(+5) + 0 = 0 + (+5) = +5$

   (ii) $(-13) + 0 = 0 + (-13) = -13$ and so on.

5. *The sum of an integer and its negative is always zero, i.e.* $a + (-a) = 0$

   e. g. (i) $3 + (-3) = 0$ (ii) $(-9) + 9 = 0$ and so on.

2. Subtraction of integers :

Change the sign of the integer to be subtracted and then add.

Example 7 :

Subtract : (i) + 5 from + 8 (ii) – 5 from + 8

(iii) + 5 from – 8 (iv) – 5 from – 8

Solution :

(i) $(+8) - (+5) = +8 - 5 = +3$ **(Ans.)**

(ii) $(+8) - (-5) = +8 + 5 = +13$ **(Ans.)**

(iii) $(-8) - (+5) = -8 - 5 = -13$ **(Ans.)**

(iv) $(-8) - (-5) = -8 + 5 = -3$ **(Ans.)**

Properties of Subtraction of Integers :

1. *The difference (subraction) of any two integers is always an integer.*

   e. g. *(i)* $8 - 3 = 5$, ***which is an integer***

   (ii) $(-6) - 2 = -6 - 2 = -8$, ***which is an integer***

2. *For any two different integers 'a' and 'b',* $a - b \neq b - a$

3. *For any three Integers 'a', 'b' and 'c',* $a - (b - c) \neq (a - b) - c$

4. *For any integer 'a',* $a - 0 \neq 0 - a$

To evaluate an expression containing various integers with plus and minus signs :

Example 8 :

Evaluate : (i) $(+18) + (-12) - (+6) - (-9)$ (ii) $-45 + (-77) - (-57) + 50$.

Solution :

(i) $(+18) + (-12) - (+6) - (-9)$

$= +18 - 12 - 6 + 9$

$= +27 - 18$ [Adding all integers with plus sign together and with minus sign together]

$= +9$ or simply 9. **(Ans.)**

(ii) $-45 + (-77) - (-57) + 50$

$= -45 - 77 + 57 + 50 = -122 + 107 = -15$ **(Ans.)**

3. Multiplication of integers :

(i) When the integers have the same sign :

The multiplication of two integers, both positive or both negative, is always a positive integer equal to the product of their absolute values.

e. g. (i) $(+4) \times (+7) = 4 \times 7 = 28.$

(ii) $(-4) \times (-7) = 4 \times 7 = 28.$

(ii) When the integers have unlike signs :

The multiplication of a positive and a negative integer is always negative.

e.g. (i) $(-30) \times (+5) = -(30 \times 5) = -150$

(ii) $(+15) \times (-6) = -(15 \times 6) = -90$

Properties of multiplication of integers :

For any three integers 'a', 'b' and 'c'

1. **a × b** is an integer, *i.e. the product* (multiplication) *of two integers is always an integer.*
2. **a × b = b × a.**
3. **a × (b × c) = (a × b) × c.**
4. **a × 0 = 0 × a = 0.**
5. **a × 1 = 1 × a = a.**
6. (i) **a × (b + c) = a × b + a × c,** (ii) **a × (b – c) = a × b – a × c**

(iii) **(b + c) × a = b × a + c × a** and so on.

4. Division of integers :

The rules for division of integers are the same as the rules for their multiplication,

i.e. (i) ***If the two integers have like signs*** (both are positive or both are negative), ***the sign of the*** quotient ***is always positive.***

e.g. $\frac{+8}{+2} = +4$, $\frac{-8}{-2} = +4$ and so on.

(ii) ***If the two integers have unlike signs, the*** quotient ***is always negative.***

e.g. $\frac{+8}{-2} = -4$, $\frac{-8}{+2} = -4$, $\frac{-12}{4} = -3$, $\frac{12}{-4} = -3$ and so on.

Properties of division of integers :

1. If **'a'** and **'b'** are two integers, then **'a' ÷ ' b'** is not necessarily an integer.

e. g. (i) $\frac{-15}{-3} = +5$, *which is an integer,*

but (ii) $\frac{5}{4}$ is *not an integer,* and the same is true for $(-7) \div 2$, $8 \div (-3)$, etc.

2. If **'a'** is a non-zero integer, *i.e.* **a ≠ 0, then 'a ÷ a'** is always equal to **unity** (1).

e.g. $(-5) \div (-5) = 1$, $(+7) \div (+7) = 1$, $15 \div 15 = 1$ and so on.

3. For any non-zero integer **'a', 0 ÷ a = 0** but **a ÷ 0** is **not defined.**

e.g. $0 \div 5 = 0$, $0 \div (-5) = 0$, but $5 \div 0$ is **not defined,** nor $(-5) \div 0$.

Also, **a ÷ b ≠ b ÷ a**

a ÷ (b ÷ c) ≠ (a ÷ b) ÷ c and so on.

EXERCISE 2(B)

1. Add :

(i) + 75 and + 56 (ii) – 75 and – 56 (iii) – 75 and + 56

(iv) + 75 and – 56 (v) 7362 and – 5937 (vi) – 570 and 0

(vii) – 38 and – 369 (viii) 642 and – 897

2. Subtract :

(i) 7 from 15 (ii) + 7 from – 15 (iii) – 7 from – 15

(iv) – 7 from 15 (v) 586 from 439 (vi) – 80 from 0

(vii) – 243 from – 300 (viii) 398 from – 398 (ix) 0 from – 87

3. Multiply :

(i) 8 and 7 (ii) – 8 and – 7 (iii) – 8 and + 7

(iv) + 8 and – 7 (v) + 243 and 0 (vi) 0 and – 96

4. Divide :

(i) 24 by – 3 (ii) – 24 by – 3 (iii) – 24 by + 3

(iv) + 24 by + 3 (v) 0 by + 73 (vi) 0 by – 48

(vii) + 666 by + 1 (viii) – 83 by + 1 (ix) + 19 by – 1

(x) – 82 by – 1 (xi) 1728 by – 12

5. Fill in the blanks :

(i) 7 + ... = 0 (ii) (– 9) + ... = 0 (iii) 56 + (– 56) = ...

(iv) (– 8) + ... = – 4 (v) (– 17) – ..... = – 4 (vi) (– 9) – ..... = 3

(vii) ..... × (– 16) = 400 (viii) – 12 × ..... = – 36 (ix) 49 ÷ ..... = – 49

(x) (– 98) ÷ ..... = 1 (xi) ..... ÷ 132 = 0 (xii) ..... ÷ (– 57) = 0

6. Evaluate :

(i) 105 + (– 61) + (– 29) (ii) 253 + (– 524) + (– 730) + 894

(iii) – 87 + (– 32) + 5 + (– 1) + (+ 4) (iv) 1 + (– 47) + (– 47) + 190

(v) 198 – (– 47) – (– 5) (vi) – 56 + (– 63) – (– 204)

(vii) 32 × (– 3) × 2 (viii) (– 6) × (– 1) × (+ 18)

(ix) (– 6) × (– 6) × (– 6) (x) (– 32) × 0 × (– 32)

(xi) (– 2) × (– 3) × (– 4) × (– 5) (xii) (– 2) × (– 3) × (– 4) × (– 5) × (– 6)

7. State ***true*** or ***false*** :

(i) The sum of an integer and its opposite is always zero.

(ii) The sum of two negative integers is positive.

(iii) The sum of a positive integer and a negative integer is negative.

(iv) The sum of three different integers can never be zero.

(v) The addition (sum) of two integers can be zero.

(vi) The subtraction (difference) of two integers can never be zero.

(vii) The product of two integers can be zero.

(viii) The product of two negative integers is negative.

(ix) The product of three negative integers is positive.

(x) The product of a negative integer and a positive integer may be zero.

8. Fill in the blanks :

(i) To subtract (– 8) from 16, we add ..... to 16.

(ii) To subtract 8 from – 16, we add ..... to – 16.

(iii) The opposite (negative) of a negative integer is a ..... integer.

(iv) If **a** and **b** are *two* integers, then **a + b** and **a – b** both are .....

(v) The product of a negative integer and zero is .....

(vi) The opposite of an integer is the same as multiplying that integer by .....

2.6 COMBINATION OF FOUR FUNDAMENTAL OPERATIONS

We know that the **four fundamental operations** are **addition** (+), **subtraction** (–), **multiplication** (×) and **division** (÷). The following are the examples in which two or more of these operations are used together :

(i) $8 + 3 - 5$ (ii) $16 - 3 \div 6$ (iii) $15 \times 4 \div 8 - 2$

(iv) $12 \times 5 \div 6$, and so on

To simplify an expression involving two or more fundamental operations, the order of simplification must be according to the letters used in the acronym* **DMAS**.

DMAS
D stands for **division**,
M stands for **multiplication**
A stands for **addition**
S stands for **subtraction**

Example 9 :

Evaluate : (i) $5 \times 3 + 12 \div 3$ (ii) $32 - 52 \div 4 + 8$

(iii) $8 \times 4 \div 2$ (iv) $8 \div 4 \times 2$

Solution :

(i) $5 \times 3 + 12 \div 3$

$= 5 \times 3 + 4$ [According to DMAS; perform D (division) first]

$= 15 + 4$ $[12 \div 3 = \frac{12}{3} = 4]$

$= 19$ [Performing multiplication (M)]

(Ans.)

(ii) $32 - 52 \div 4 + 8$ [First of all division D]

$= 32 - 13 + 8$ $[52 \div 4 = 13]$

$= 40 - 13$ [Then addition (A) and then subtraction (S)]

$= 27$

(Ans.)

* An acronym is a word formed by the first letter of a larger expression.

(iii) $8 \times 4 \div 2$ [Division first]

$= 8 \times 2$ [Now multiplication]

$= 16$ **(Ans.)**

(iv) $8 \div 4 \times 2$ [First division]

$= 2 \times 2$ [Then multiplication]

$= 4$ **(Ans.)**

Example 10 :

Evaluate : (i) $28 - 15 \div 3 - 4 \times (-6)$ (ii) $56 + 5 \times (-3) + 48 \div 8$

Solution :

(i) $28 - 15 \div 3 - 4 \times (-6)$

$= 28 - 5 - 4 \times (-6)$ [Division, *i.e.* $15 \div 3 = 5$]

$= 28 - 5 + 24$ [Then multiplication, *i.e.* $-4 \times (-6) = +24$]

$= 52 - 5$ [Then addition and then subtraction]

$= 47$ **(Ans.)**

(ii) $56 + 5 \times (-3) + 48 \div 8$

$= 56 + 5 \times (-3) + 6$ [Division, *i.e.* $48 \div 8 = 6$]

$= 56 - 15 + 6$ [Multiplication, *i.e.* $+5 \times (-3) = -15$]

$= 62 - 15$

$= 47$ **(Ans.)**

EXERCISE 2(C)

Evaluate :

1. $7 \times 12 + 75 \div 15$
2. $96 \div 12 - 2 \times 3$
3. $24 \times (-4) + 144 \div 6$
4. $48 \div (-2) - 72 \times 3$
5. $18 \times 24 \div 4$
6. $36 \div 12 \times 4$
7. $62 - 56 \div 4 + 5 \times (-7)$
8. $56 + 2 \times (-15) - 45 \div 9$
9. $17 + 95 \div 19 + 4 \times (-7)$
10. $70 \div 14 \times 3 - 45 \div 9$

Revision Exercise (Chapter 2)

Evaluate :

1. State ***true*** or ***false*** :

(i) $|49| = |-49|$ (ii) $|-49| = -|49|$ (iii) $|-49| - |49| = 0$

2. **(a) Add :**

(i) + 88 and – 124 (ii) – 73 and 54 (iii) + 26, 58 and – 61

(iv) – 89, + 16 and – 35 (v) – 26, – 38 and + 19

(b) Subtract :

(i) + 62 from + 39 (ii) + 39 from + 62

(iii) + 62 from – 39 (iv) + 39 from – 62

(c) Multiply :

(i) + 38 and + 9 (ii) + 24 and – 17

(iii) – 49 and + 32 (iv) – 56 and – 13

(d) Divide :

(i) + 63 by + 21 (ii) + 135 by – 45

(iii) – 96 by + 16 (iv) – 112 by – 7

3. Evaluate :

(i) (+ 32) – (+ 78) + (+ 65) (ii) (– 32) – (– 78) – (+ 65)

(iii) (+ 32) + (– 78) – (– 65) (iv) (– 32) – (+ 78) – (+ 65)

(v) (– 7) × (– 7) × 7 (vi) (– 7) × (– 7) × (– 7)

(vii) (– 7) + (– 7) + (– 7) (viii) (– 6) × 5 × (– 2) × (– 3)

(ix) (– 8) × 6 × 5 × (– 3) (x) (+ 7) × (+ 15) × 0 × (– 4)

4. If **– 70** represents **a loss of ₹ 70,** what does each of the following represent ?

(i) + 60 – 34 (ii) – 34 + 60 (iii) + 55 – 86 + 10

(iv) – 75 + 46 – 10

(iv) – 75 + 46 – 10 = – 39; which represents a loss of ₹ 39. **(Ans.)**

5. If **+ 42** represents **42 m above the water surface**, what does each of the following represent :

(i) – 87 + 55 (ii) + 98 – 115

(iii) + 36 + 57 – 73 (iv) – 42 – 23 + 39

6. What must be added to :

(i) – 26 to get 18 ? (ii) 26 to get – 18 ?

(iii) – 26 to get – 18 ? (iv) 26 to get 18 ?

∴ (i) **Required number** = 18 – (– 26)

= 18 + 26 = **44** **(Ans.)**

7. What must be subtracted from :

(i) – 48 to get 13 ? (ii) 48 to get 13 ?

(iii) – 48 to get – 13 ? (iv) 48 to get – 13 ?

∴ (i) **Required number** = – 48 – 13

= **– 61** **(Ans.)**

8. Evaluate :

(a) (i) (– 17) × (– 6) × 8 (ii) 8 × (– 17) × (– 6) (iii) 13 + (– 7) + 10

(iv) 10 + 13 + (– 7)

(b) Are the results of (i) and (ii) the same ? If yes, specify the property in words.

(c) Are the results of (iii) and (iv) the same ? If yes, specify the property in words.