

CHAPTER - 1

INTEGERS

- Integers are a bigger collection of numbers which is formed by whole numbers and their negatives.
- You have studied in the earlier class, about the representation of integers on the number line and their addition and subtraction.
- We now study the properties satisfied by addition and subtraction.
 - (a) Integers are closed for addition and subtraction both. That is, $a + b$ and $a - b$ are again integers, where a and b are any integers.
 - (b) Addition is commutative for integers, i.e., $a + b = b + a$ for all integers a and b .
 - (c) Addition is associative for integers, i.e., $(a + b) + c = a + (b + c)$ for all integers a , b and c .
 - (d) Integer 0 is the identity under addition. That is, $a + 0 = 0 + a = a$ for every integer a .
- We studied, how integers could be multiplied, and found that product of a positive and a negative integer is a negative integer, whereas the product of two negative integers is a positive integer. For example, $-2 \times 7 = -14$ and $-3 \times -8 = 24$.
- Product of even number of negative integers is positive, whereas the product of odd number of negative integers is negative.
- Integers show some properties under multiplication.
 - (a) Integers are closed under multiplication. That is, $a \times b$ is an integer for any two integers a and b .
 - (b) Multiplication is commutative for integers. That is, $a \times b = b \times a$ for any integers a and b .
 - (c) The integer 1 is the identity under multiplication, i.e., $1 \times a = a \times 1 = a$ for any integer a .
 - (d) Multiplication is associative for integers, i.e., $(a \times b) \times c = a \times (b \times c)$ for any three integers a , b and c .
- Under addition and multiplication, integers show a property called distributive property. That is, $a \times (b + c) = a \times b + a \times c$ for any three integers a , b and c .
- The properties of commutativity, associativity under addition and multiplication, and the distributive property help us to make our calculations easier.
- We also learnt how to divide integers. We found that,

(a) When a positive integer is divided by a negative integer, the quotient obtained is a negative integer and vice-versa.

(b) Division of a negative integer by another negative integer gives a positive integer as quotient.

- For any integer a , we have

(a) $a \div 0$ is not defined

() $\div 1 = a$

