

S.B.O.A SCHOOL AND JUNIOR COLLEGE,  
CHENNAI – 101

STD: 8

SUBJECT: MATHS

1. Closure property

Integers are closed under addition, subtraction and multiplication but not closed under division, for any two integer 'a' and 'b'

1.  $a + b$  is an integer eg.  $-3 + 2 = -1$
2.  $a - b$  is an integer eg.  $-3 - (-2) = -3 + 2 = -1$
3.  $a \times b$  is an integer eg.  $-3 \times (+2) = -6$
4. But for any integer 'a',  $a \div 0$  is not defined.

2. Commutative property

For any two integers 'a' and 'b',

- 1)  $a + b = b + a$ , eg.  $-3 + 1 = +1 - 3 = -2$
- 2)  $a \times b = b \times a$ , eg.  $(-3) \times 1 = 1 \times (-3) = -3$

but

- 3)  $a - b \neq b - a$ , eg.  $-5 - (+1) \neq +1 - (-5)$   
 $-6 \neq +6$
- 4)  $a \div b \neq b \div a$ , eg.  $-4 \div 2 \neq 2 \div (-4)$   
 $-2 \neq -\frac{1}{2}$

3. Associative property

For any three integers a, b and c

- 1)  $a + (b + c) = (a + b) + c$   
Eg.  $(-4) + [5 + (-2)] = [-4 + 5] + (-2)$   
 $-1 = -1$
- 2)  $a \times (b \times c) = (a \times b) \times c$
- 3)  $a - (b - c) \neq (a - b) - c$
- 4)  $a \div (b \div c) \neq (a \div b) \div c$

4. Distributive Property

For any three integers a, b and c

- 1)  $a \times (b + c) = (a \times b) + (a \times c)$
- 2)  $a \times (b - c) = (a \times b) - (a \times c)$

5. Identity

1) Additive Identity

'0' is the additive identity of all integers.

Eg.  $9 + 0 = 9 + 0 = 9$

2) Multiplicative Identity

'1' is the multiplicative identity of all integers

Eg.  $-23 \times 1 = -23$

6. Inverse

1) Additive Inverse

For an integer 'a',  $-a$  is the additive inverse as,  $a + (-a) = (-a) + a = 0$

2) Multiplicative Inverse

For an integer 'a',  $\frac{1}{a}$  is the multiplicative inverse as,  $a \times \frac{1}{a} = \frac{1}{a} \times a = 1$

1. Check the commutative property for addition of integers if
  - 1)  $a = -565, b = -308$
  - 2)  $a = +710, b = 819$
  - 3)  $a = -254, b = 254$
  - 4)  $a = -610, b = +440$
2. Check if  $a \times b = b \times a$  for the following set of integers.
  - 1)  $a = +15, b = -10$
  - 2)  $a = +22, b = 25$
  - 3)  $a = -25, b = -5$
  - 4)  $a = -39, b = +40$
3. Verify the associative property for multiplication of integers if
  - 1)  $a = +5, b = -2, c = -4$
  - 2)  $a = -7, b = +4, c = -5$
  - 3)  $a = -2, b = -7, c = -3$
  - 4)  $a = -4, b = 0, c = 10$
4. Write the distributive property of multiplication over addition for any three integers and check
  - 1)  $a = 10, b = -25, c = +10$
  - 2)  $a = -15, b = -10, c = 5$
5. Evaluate the following
  - 1)  $125 - 30 + 49 - (-70)$
  - 2)  $-1300 - 400 - 700 + 400$
  - 3)  $-512 + 30 + 482$
  - 4)  $60 \times (-50) \times (-9) \times 100$
  - 5)  $12 \times (-613) \times 42 \times 0 \times (-72)$
  - 6)  $(-48 \div 12) \div 4$
  - 7)  $(-6 + 5) \div [(-2) + 1]$
6. Verify  $a \div (b \div c) \neq (a \div b) + (a - c)$  for each of the following values of a, b and c.
  - 1)  $a = 12, b = -4, c = 2$
  - 2)  $a = -10, b = 1, c = 1$
7. Write 5 pairs of integers such that  $a \times b = -24$   
Eg.  $1 \times (-24) = -24$  Ans (1, -24)
8. Find the product using suitable properties
  - 1)  $425 \times (-75) + (-25) \times 425$
  - 2)  $86 \times (70 - 2)$
  - 3)  $638 \times (-99)$
  - 4)  $12 \times (-25) \times 5 \times (-4)$
  - 5)  $8 \times 62 \times (-125)$
  - 6)  $(-72) \times (-18) + (-72) \times 8$