

## CHAPTER 01

## Rational Numbers

**Commutative property:**

To understand the commutative property of any two whole numbers under addition.

Take two whole numbers 0 and 3.

**Example:**

Is  $0 + 3$  equal to  $3 + 0$ ?

Yes,  $0 + 3 = 3 + 0 = 3$  is also a whole number.

∴ Two whole numbers can be added in any order.

We can conclude that,  $a + b = b + a$  where a, b are whole numbers.

So commutative property exists under addition. Now coming to multiplication of whole numbers.

Is  $0 \times 3$  equal to  $3 \times 0$ ?

Yes,  $0 \times 3 = 3 \times 0 = 0$  is also a whole number.

∴ Two whole numbers can be multiplied in any order.

We can conclude that,  $a \times b = b \times a$ , where a, b are whole numbers.

∴ Commutative property exists under multiplication of any two whole numbers.

**Subtraction of whole numbers:**

Is  $0 - 4$  equal to  $4 - 0$ ?

No,  $0 - 4 \neq 4 - 0$

$$\boxed{-4 \neq 4}$$

Two whole numbers cannot be subtracted in any order.

So we can conclude that,  $\boxed{a - b \neq b - a}$ .

$\therefore$  Commutative property does not exist under subtraction any two whole numbers.

Similarly,

Is  $6 \div 2$  equal to  $2 \div 6$ ?

No,  $\frac{6}{2}$  is equal to 3 and  $\frac{2}{6}$  is equal to  $\frac{1}{3}$ .

$$\therefore \frac{6}{2} \neq \frac{2}{6}$$

Two whole numbers cannot be divided in any order.

Therefore, division of any two whole numbers does not exist commutative property.