CHAPTER 1 RATIONAL NUMBERS

Students we have already studied about the rational numbers in class 7, now we are going to explore more about the rational numbers.

Kindly note down the following points in a register if you have or in any old copy or pages:

Rational numbers: A number is called rational if it can be expressed in the form p/q where p and q are integers (q ≠ 0).

Example: 2/1, 3/4, -5/6, 1/1, -9/10 etc. Since 0,-2,1,4 etc can be written in the form p/q, so they are also rational numbers.

Properties of rational numbers

1. **CLOSURE PROPERTY: a) Addition:** For any two rational numbers a and b, a + b is also a rational number. So we say that rational numbers are closed under addition.

   Example: $\dfrac{3}{8} + (\dfrac{-5}{7}) = \dfrac{21+(-40)}{56} = \dfrac{-19}{56}$ (a rational number)

   b) Subtraction: For any two rational numbers a and b, a - b is also a rational number. So we say that rational numbers are closed under subtraction.

   Example: $\dfrac{-5}{7} - \dfrac{2}{3} = \dfrac{-29}{21}$ (a rational number)

   c) Multiplication: For any two rational numbers a and b, a × b is also a rational number. So we say that rational numbers are closed under multiplication. example: $\dfrac{-2}{3} \times \dfrac{4}{5} = \dfrac{-8}{15}$ (a rational

number)

d) Division: we note that $\frac{-5}{3} \div \frac{2}{5} = \frac{-25}{6}$ (a rational number)

but, $\frac{2}{5} \div 0$ **is not defined**. So we say that rational numbers are **not closed** under division.

2. **COMMUTATIVE PROPERTY: a) Addition:** For any two rational numbers a and b, a + b = b + a. so we say that addition is commutative for rational numbers.

Example: $\frac{-2}{3} + \frac{5}{7} = \frac{1}{21}$ and $\frac{5}{7} + (\frac{-2}{3}) = \frac{1}{21}$

so, $\frac{-2}{3} + \frac{5}{7} = \frac{5}{7} + (\frac{-2}{3})$

b) Subtraction: We note that $\frac{2}{3} - \frac{5}{4} = \frac{-7}{12}$ but $\frac{5}{4} - \frac{2}{3} = \frac{7}{12}$

so we say that subtraction is **not commutative** for rational numbers.

c) Multiplication: For any two rational numbers a and b, a × b = b × a. so we say that multiplication is commutative for rational numbers.

Example: $\frac{-2}{3} \times \frac{5}{7} = \frac{-10}{21}$ and $\frac{5}{7} \times (\frac{-2}{3}) = \frac{-10}{21}$

So, $\dfrac{-2}{3} \times \dfrac{5}{7} = \dfrac{5}{7} \times (\dfrac{-2}{3})$

d) Division: We note that $\dfrac{-2}{3} \div \dfrac{5}{7} = \dfrac{-14}{15}$ and $\dfrac{5}{7} \div (\dfrac{-2}{3}) = \dfrac{15}{-14}$

we say that division is **not commutative** for rational numbers.

*****note: students write and understand the above properties, I will upload other properties in the next content. Be at home and stay safe***** (Mrs. Vandana Tuli)