RATIONAL NUMBERS

## PERIOD 1

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 1
CHAPTER NAME : RATIONAL NUMBERS

Learning outcome

❑ Students will be able to understand that the decimal representation of a rational number is either **terminating or repeating**.

❑ Students will be able to understand the difference between **rounding a decimal and truncating it.**

❑ Students will be able to solve **real-world problems** involving all four operations with rational number.
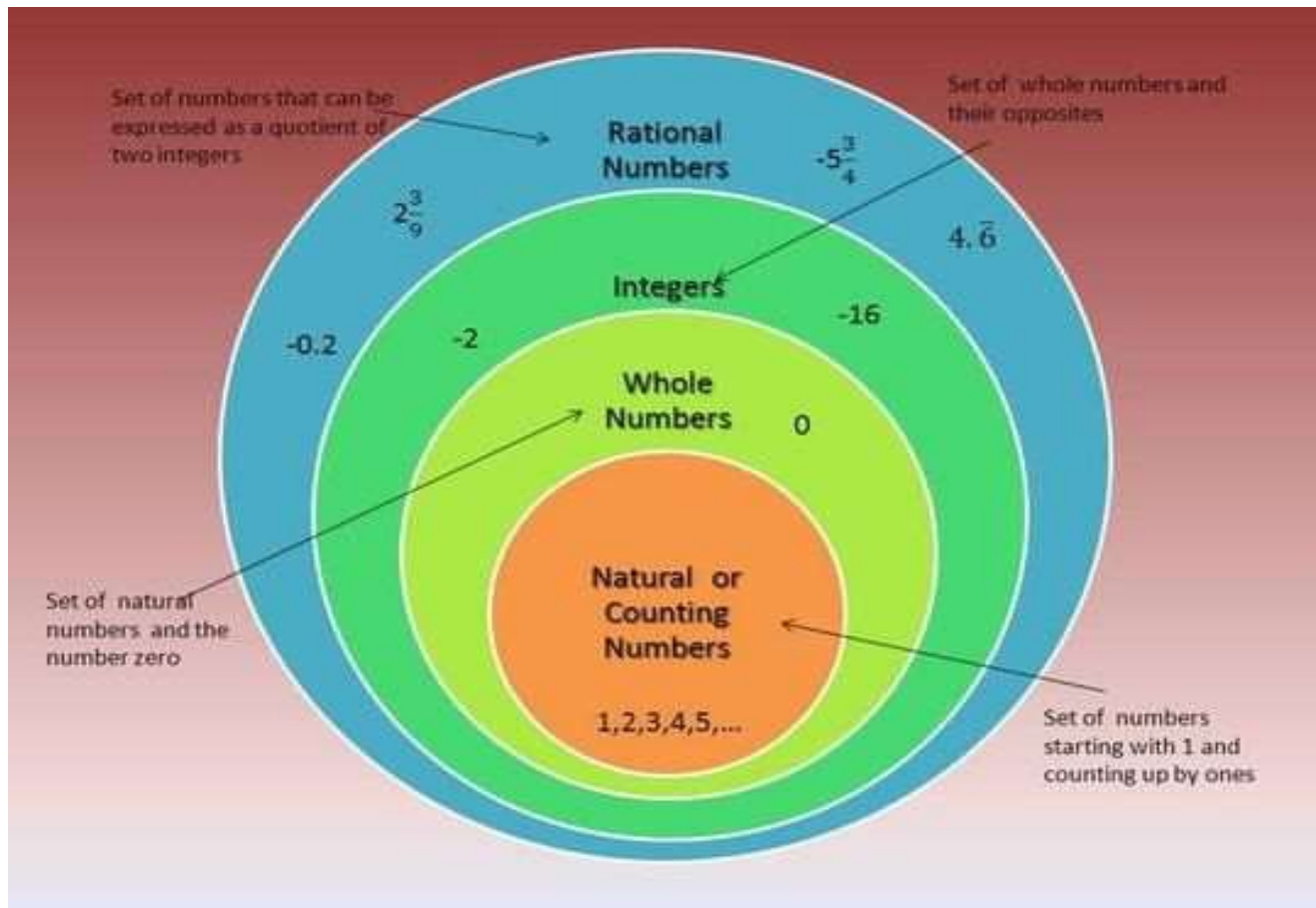
Introduction

- https://www.youtube.com/watch?v=9yvtLN_24G0 (4:29)
- Natural numbers : Counting numbers = 1,2,3,4,5,--------
- Whole numbers   : 0 (zero) with natural numbers = 0,1,2,3,4,5,-------
- Integers   : Negative of natural numbers together with whole numbers

  = -5,-4,-3,-2,-1,0,1,2,3,4,5,----------

Rational Number

A rational numbers are represented in **p/q** form where q is not equal to zero, where p and q both are integers .

For example :3/5, -5/7,etc.

Remember :

1. Zero is a rational number. It can be expressed as 0/1,0/2,0/7, etc. In each of the cases denominator is not equal to zero.

2. In the rational number p/q , integer p is called numerator and q is called denominator.

3.If numerator and denominator have same signs then the rational number is positive.

For example:3/5,-5/-7, etc.

4.If numerator and denominator have same signs then rational is positive, where as
   rational number is negative, if its numerator and denominator has opposite signs.
   For example:-
   (i) each of 5/7, -5/-7, -12/-13, etc. is positive.
   (ii) each of -5/7, 5/-7, -12/13, etc. is negative.
5.If n is a non-zero integer and p/q is a rational number, then
   p/q= (pxm) ÷(qxm) and p/q= (p÷m) ÷(q÷m)
6.Let a/b and c/d are two rational numbers such that a/b = c/d => axd = bxc

7.A rational number p/q is said to be in standard form , if :

(i)p and q have no common factor other than one and

(ii)q is positive

For example :

(i)5/7 is a rational number in a standard form.

(ii)-15/18 is not in standard form as 15 and 18 have 3 as a common divisor.

Since, -15/18 = (-5x3)/(6x3) = -5/6

(iii)21/-28 = (3x7)/(-4x7) = 3/-4 = -3/4

=>21/-28 in standard form is -3/4.

Add, each pair of rational numbers, given below, and show that their addition (sum) is also a rational number.

1.(i) −5/8 and 3/8

Adding addition sign in between,

=−5/8+3/8 (∵ Denominators are same, LCM=8)

=−5/8+3/8=−5+3/8

=−2/8=−1/4 (Cancelling numerator and denominator by 2)

Which is a rational number.

(iii)

   6/11 and −9/11

Solution:

6/11 and −9/11

Adding addition sign in between

=6/11+(−9/11)=6/11+(−9/11) (∵ Denominators are same, ∴LCM=11)

=6−9/11=−3/11

Which is a rational numb

(iv) 5/−26 and 8/39

Solution:

5/−26 and 8/39

Adding addition sign in between

=5/−26+8/39

Taking L.C.M.

∴LCM of 26 and 39 = 2 × 3 × 13 = 78

5/−26+8/39=−5×3/26×3+8×2/39×2

=−15+16/78

=1/78

Which is a rational number.

Home assignment

Exercise 1(A) – Q No. 1,2

1. **What is the negative of negative rational number?**

2. **Is zero a rational number? Justify it.**

3. Write the greatest negative integer.