पुणा International School
Shree Swaminarayan Gurukul, Zundal

Class -8 **RATIONAL NUMBERS**

Properties of rational numbers

Rational means anything which is completely logical whereas irrational means anything which is unpredictable and illogical in nature. The word rational has evolved from the word ratio. In general, rational numbers are those numbers that can be expressed in the form of p/q, in which both p and q are integers and q≠0. We can denote these numbers by **Q.**

Closure property

For two rational numbers say x and y the results of addition, subtraction and multiplication operations give a rational number. We can say that rational numbers are closed under addition, subtraction and multiplication. For example:

- (7/6)+(2/5) = 47/30
- (5/6) – (1/3) = 1/2
- (2/5). (3/7) = 6/35
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Do you know why division is not under closure property?

The division is not under closure property because division by zero is not defined. We can also say that except ‘0’ all numbers are closed under division.

Commutative law

For rational numbers, addition and multiplication are commutative.

Commutative law of addition: **a+b = b+a**

Commutative law of multiplication: **a×b = b×a**

For example:

Subtraction is not commutative property i. e. a-b ≠ b-a. This can be understood clearly with the following example

2/3-1/3=1/3

whereas

1/3-2/3=-1/3

The division is also not commutative i.e. a/b ≠ b/a as,

1/3÷2/3=1/3x3/2=1/2

2/3÷1/3=2/3x3/1=2

whereas,

Associative law

Rational numbers follow the associative property for addition and multiplication.

Suppose x, y and z are rational then for addition: **x+(y+z)=(x+y)+z**

For multiplication: **x(yz)=(xy)z.**

Some important properties that should be remembered are:

- 0 is an additive identity and 1 is a multiplicative identity for rational numbers.
- For a rational number x/y, the additive inverse is -x/y and y/x is the multiplicative inverse.