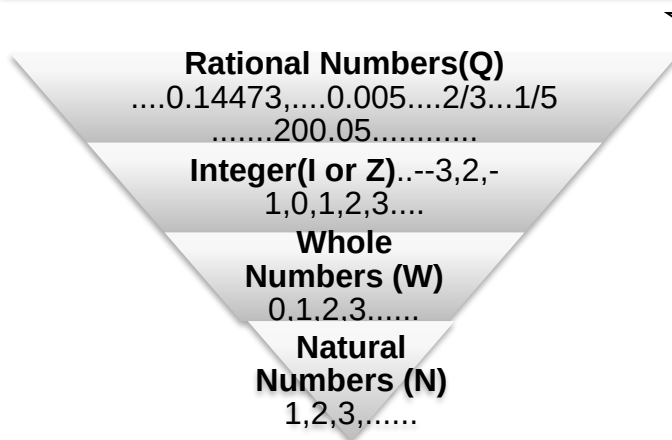


RATIONAL NUMBERS

Real numbers(R)- Rational and irrational numbers taken together are real numbers

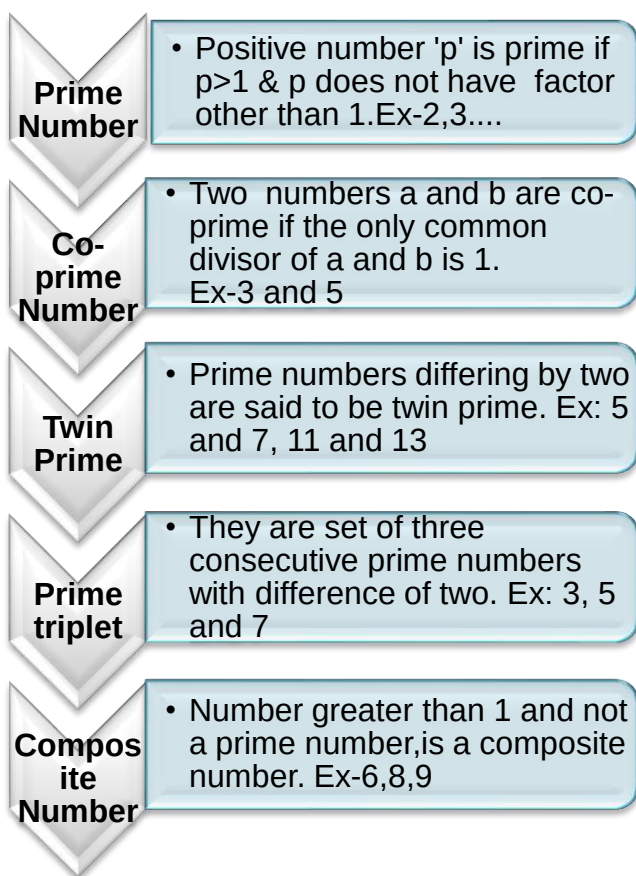


Irrational numbers($\bar{Q}$)

Ex: $\sqrt{2}$, $\sqrt{7}$, $3-\sqrt{5}$, $\sqrt{2}+\sqrt{8}$

“TESTS OF DIVISIBILITY”

- ❖ **Division by 2:** The last digit should be divisible by 2. Ex 52
- ❖ **Division by 3:** The sum of its digit is divisible by 3. Ex 192 (1+9+2=12 is divisible by 3)
- ❖ **Division by 4:** The last two digits should be divisible by 4. Ex 172
- ❖ **Division by 5:** The last digit should be either 0 or 5. Ex 65,90
- ❖ **Division by 6:** The number should be divisible by 2 and 3. Ex 12
- ❖ **Division by 8:** The last three digits should be divisible by 8. Ex 33176
- ❖ **Division by 9:** The sum of its digit is divisible by 9. Ex 198 (1+9+8=18 is divisible by 9)
- ❖ **Division by 10:** The last digit should be 0. Ex 1120
- ❖ **Division by 11:** The difference between sum of even digits and sum of odd digits should be either 0 or multiple of 11. Ex 72512 (sum of even = 2+1=3 and sum of odd places = 7+5+2=14. Their difference is 13-3=11)



Rationalizing factor (RF): The product of two rational factor is a rational, each is called rationalizing factor of other. Ex: $(\sqrt{3}+1) \times (\sqrt{3}-1) = 3-1 = 2$ is rational. $(\sqrt{3}+1)$ and $(\sqrt{3}-1)$ are RF of each other

RATIONAL NUMBERS

Rationalisation

- It is a process of multiplying an irrational number by its rationalising factor.
- **Step 1:** Divide and multiply by rationalising factor of the denominator
- **Step 2 :** Simplify , if necessary

PROPERTIES OF NUMBERS

CLOSURE PROPERTY : For any two numbers 'a' and 'b' belonging to N, W, I or Q. Then $(a+b)$, $(a-b)$, $(a \times b)$ and $(a \div b)$ also belongs to N, W, I or Q respectively

COMMUTATIVE PROPERTY : For any two numbers 'a' and 'b' belonging to N, W, I or R, it can be shown that $a+b = b+a$; $a-b \neq b-a$; $a \times b = b \times a$; $a \div b \neq b \div a$

ASSOCIATIVE PROPERTY : For any three numbers 'a' , 'b' and 'c' belonging to N, W, I or R, it can be shown that $a+(b+c) = (a+b)+c$; $a-(b-c) \neq (a-b)-c$; $a \times (b \times c) = (a \times b) \times c$; $a \div (b \div c) \neq (a \div b) \div c$

DISTRIBUTIVE PROPERTY : For any three numbers 'a' , 'b' and 'c', the following results are true $a \times (b+c) = (a \times b) + (a \times c)$ and $a \times (b-c) = (a \times b) - (a \times c)$

- If zero is added to any number, the value of the number remains unchanged.
This property of zero is called “Identity for Addition”. Ex : $5+0=5$
- If one is multiplied with any number, the value of number remains unchanged.
This property of one is called “Identity for Multiplication”. Ex: $(-6) \times 1 = (-6)$