Real number

Euclid's Division Lemma

For a and b any two positive integer, we can always find unique integer q and r such that

$a=bq + r \quad , \quad 0 \le r \le b$

If r =0, then b is divisor of a.

HCF (Highest common factor)

HCF of two positive integers can be find using the Euclid's Division Lemma algorithm

We know that for any two integers a,b. we can write following expression

$a=bq + r \quad , \quad 0 \le r \le b$

If r=0 ,then

HCF(a,b) =b

If $r \neq 0$, then

HCF (a,b) = HCF (b,r)

Again expressing the integer b,r in Euclid's Division Lemma, we get

$b=pr + r_1$

HCF (b,r)=HCF (r,r_1)

Similarly successive Euclid 's division can be written until we get the remainder zero, the divisor at that point is called the HCF of the a and b

Some other points to remember

- The HCF of three numbers can be calculated by first calculating the HCF of first two numbers ,then the calculating the HCF of the HCF of previous two numbers and third number.
- If HCF (a,b) =1 ,the a and b are co primes.

Fundamental Theorom of Arithmetic

Every composite number can be written as the product of power of primes and this factorization is unique

Composite number = Product of primes

HCF and LCM by prime factorization method

HCF = Product of the smallest power of each common factor in the numbers

LCM = Product of the greatest power of each prime factor involved in the number

Also important Formula to remember

HCF (a,b) X LCM (a,b) =a X b

Irrational Numbers

A number r is called irrational number if it cannot be expressed in the form p/q where p and q are integer and $q \neq 0$

Important Theorem

Let p be a prime number ,if p divides a^2 ,the p divide a where a is positive number

Rational numbers

A number r is called rational number if it can be expressed in the form p/q where p and q are integer and q≠0.

Decimal expressions of rational number are of two types

a) Terminating decimal expression

b) Non terminating repeating decimal expression

Terminating decimal expression can be written in the form

$p/2^n5^m$

Non terminating repeating decimal expression can not be expressed in this form

$p/2^n5^m$