Real Numbers 1

Euclid's Division Lemma :

$$\boxed{a = bq + r}$$

where $(0 \leq r < b)$

$$\begin{array}{c|c} & q \\ \hline b & a \\ \hline & r \end{array}$$

Euclid's Division algorithm :

HCF of a & b with $a > b$

Step-1 Apply Euclid's Division Lemma to find q and r where $\boxed{a = bq + r}$, $(0 \leq r < b)$

$$\begin{array}{c|c} & q \\ \hline b & a \\ \hline & r \end{array}$$

Step-2 If $r = 0$, then HCF $= b$.

If $r \neq 0$, then apply Euclid's Lemma to b and r

Step-3 Continue the process till $r = 0$

Fundamental Theorem of Arithmetic :

Prime factorisation of every composite number is unique.

If p is a Prime number

If a^2 is divisible by p
then a is divisible by p.

HCF ⟶ maximum or greatest or largest

Highest common factor

LCM → minimum or least or smallest

Least common multiple

HCF X LCM = Product of 2 numbers

Prime numbers : 2, 3, 5, 7, 11, 13, 17, 19, 23, 29

Prime numbers : whose factors only 1 and itself.

Composite numbers : whose factors other than 1 and itself.

Co-Prime numbers : whose HCF = 1

Identity :

$$(a+b)^3 = a^3 + b^3 + 3ab(a+b)$$

$$(a-b)^3 = a^3 - b^3 - 3ab(a-b)$$

$$a^3 + b^3 = (a+b)(a^2 + b^2 - ab)$$
$$a^3 - b^3 = (a-b)(a^2 + b^2 + ab)$$

Rational numbers :

$\frac{p}{q}$ → factors 2 or 5 or 2 and 5 → **Terminating**

1.625 , 1.43
1.2 , etc.

$\frac{p}{q}$ → factors other than 2 and 5 → **Non-Terminating but Repeating**

1.333..... 1.2626..... 7.249249.....

Irrational numbers : → **Non-Terminating Non-Repeating**

1.01001000100001.....3.72722722.....