Date- 17-04-2018

Day - Thrusday

Chapter - 1
Real numbers

- Natural numbers

Natural numbers starts from 1 to infinite (α). It is usually denoted by 'N'

for e.g ÷ 1, 2, 3 ------ α

- Whole numbers

Whole numbers starts from 0 to infinite (α).

for e.g ÷ 0, 1, 2, ------- α

- Integers

Positive and negative numbers including zero are called integers.

for e.g ÷ -2, -1, 0, 1, 2 -------

- Rational numbers

Numbers in the form of $\frac{p}{q}$ and where $q \neq 0$ & p and q are integers are called rational number

for e.g ÷ $\frac{1}{2}$, $\frac{-3}{4}$ -------

- Irrational numbers

Those numbers which are not perfect square root.

for e.g ÷ $\sqrt{2}$, $\sqrt{3}$ ------- etc.

- Real numbers.

The Collection of rational and irrational numbers taken together are called Real numbers.

for e.g ÷ $2\sqrt{2}$, -2, -1, $\sqrt{3}$ etc.

- Euclid division lemma

The two positive integers a and b their exist unique integers q and r which satisfying $a = bq + r$.

Where $0 \leq r < b$.

- Euclid division alogrithm

To obtain the HCF of two positive integers say c and d, with $c > d$, follow the steps below.

Step - 1

Apply Euclid's divisions lemma, to c and d. So we find whole numbers, q and r Such th
$c = dq + r$, $0 \leq r < d$

Step-2

If $r = 0$, d is the HCF of c and d, If $r \neq 0$, apply the division lemma to d and r.

Step-3

Continue the process till the remainder is zero, the division at this stage will be the required HCF

- **Alrither**

It is a series of well defined steps which gives a procedure for solving a type of problem.

- **lemma**

A lemma is a proven statement used for proving another statement.

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Real numbers

Ex = 1.1

Q1 = Use Euclid 's division algorithm to find the HCF of :

(i) 135 and 225

Sol = Let a = 225 , b = 135

$$\begin{array}{r|l} 135 & \overset{1}{225} \\ & -135 \\ \hline & 90 \end{array}$$

Using Euclid division

a = bq + r

225 = 135 × 1 + 90

Taking 135 and 90

$$\begin{array}{r|l} 90 & \overset{1}{135} \\ & 90 \\ \hline & 45 \end{array}$$

Using Euclid division

135 = 90 × 1 + 45

Again taking 90 and 45

$$\begin{array}{r|l} 45 & \overset{2}{90} \\ & 90 \\ \hline & 0 \end{array}$$

$a = bq + r$

Using Euclid division

$90 = 45 \times 2 + 0$

$\therefore \boxed{HCF = 45}$

(iii) 196 and 38220

Sol: Let $a = 38220$ and $b = 196$

$$\begin{array}{r} 195 \\ 196 \enclose{longdiv}{38220} \\ -196 \\ \hline 1862 \\ -1764 \\ \hline 980 \\ -980 \\ \hline 0 \end{array}$$

Using Euclid division

$a = bq + r$

$38220 = 196 \times 195 + 0$

$\therefore \boxed{HCF = 196}$

(iv) 867 and 255

Sol: Let $a = 867$ and $b = 255$

$$\begin{array}{r} 3 \\ 255 \enclose{longdiv}{867} \\ 765 \\ \hline 102 \end{array}$$

Using Euclid division

$a = bq + r$

$867 = 255 \times 3 + 102$

Taking 255 and 102

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$$\begin{array}{r} 2 \\ 102 \overline{)255} \\ \underline{204} \\ 51 \end{array}$$

Now, Euclid division
$255 = 102 \times 2 + 51$

Now, taking 102 and 51

$$\begin{array}{r} 2 \\ 51 \overline{)102} \\ \underline{102} \\ 0 \end{array}$$

using Euclid division
$102 = 51 \times 2 + 0$
$\therefore \boxed{HCF = 51}$

Q2:- Show that any positive and integer is of the factor $6q+1$ or $6q+3$ or $6q+5$ where q is the some together

Sol:-

$6q+1, \ 6q+3, \ 6q+5$
Since $a = bq + r$ —— ① or $\leq r < b$
$0 \leq r < b$

Here $b = 6$
$r = 0, 1, 2, 3, 4, 5$
eq:- (i) → $a = 6q + 0$
$a = 6q + 1$
$a = 6q + 2$
$a = 6q + 3$
$a = 6q + 4$
$a = 6q + 5$