STD – 10 MATHS

CHAPTER - 1

REAL NUMBER

EXERCISE -1.1(Q.1)

Euclid's division lemma(Algorithm)

- If a and b are two positive integers then they must satisfy the condition.
- $a = bq + r$ where $0 \leq r < b$

$$a = bq + r$$

dividend divisor quotient reminder

Use of Euclid division lemma

For division

Find H.C.F

EX. Find H.C.F OF 45 AND 6.

Step . 1 $45 > 6$

So that $a = 45$, $b = 6$

$$\begin{array}{r} 7 \\ 6\overline{)45} \\ \underline{42} \\ 3 \end{array}$$

We get $q = 7$, $r = 3$

Use Euclid division lemma

$$a = bq + r$$

$$45 = (6 \times 7) + 3$$

Step . 1 $6 > 3$

So that $a = 6$, $b = 3$

$$\begin{array}{r} 2 \\ 3\overline{)6} \\ 6 \\ \hline 0 \end{array}$$

We get $q = 2$, $r = 0$

Use Euclid division lemma

$6 = (3 \times 2) + 0$

We have $r = 0$, so that our method stops here. Since, in the last step the divisor is 3, therefore, HCF = (45 , 6) = 3.

Q.1 Use Euclid's division algorithm to find HCF.

(i) 135 and 225

- **225 is greater than 135. Therefore, by Euclid's division algorithm,**

a = 225 , b = 135

$$\begin{array}{r} 1 \\ 135\overline{)225} \\ \underline{-135} \\ 90 \end{array}$$

we get, $q = 1$ $r = 90$

Use Euclid division lemma

$a = bq + r$

$225 = (135 \times 11) + 90$

Now, remainder $90 \neq 0$, thus again use division lemma

$a = 135$, $b = 90$

$$\begin{array}{r} 1 \\ 90\overline{)135} \\ -\underline{90} \\ 45 \end{array}$$

we get, $q = 1$, $r = 45$

According to **Euclid division lemma**

$135 = (90 \times 1) + 45$

Again, $45 \neq 0$, thus again use division lemma

$a = 90$ $b = 45$

$$
\begin{array}{r}
2 \\
45\overline{)90} \\
-90 \\
\hline
00
\end{array}
$$

we get, $q = 2$ $r = 0$

We have $r = 0$, so that our method stops here. Since, in the last step, the divisor is 45,

therefore, HCF $= (225\ ,\ 135)$

$= 45.$

(ii) 196 and 38220

- 38220 is greater than 196, Therefore, by Euclid's division algorithm,

  $a = 38220$, $b = 196$

$$
\begin{array}{r}
195 \\
196\overline{)38220} \\
-\underline{38220} \\
0
\end{array}
$$

we have, $q = 195$, $r = 0$

Use Euclid division lemma

$38220 = (196 \times 195) + 0$

We have $r = 0$, so that our method stops here. Since, in the last step, the divisor is 195,

so that HCF = (196 , 38220)

= 195

(iii) 867 and 255

- 867 is greater than 255, Therefore, by Euclid's division algorithm,

  a = 867   b = 255

$$\begin{array}{r} 3 \\ 255\overline{)867} \\ -765 \\ \hline 102 \end{array}$$

we get, $q = 3$, $r = 102$

$867 = (255 \times 3) + 102$

Again, $102 \neq 0$, therefore again use division lemma

$a = 255$ $b = 102$

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

we have, $q = 2$, $r = 51$

$255 = (102 \times 2) + 51$

Again, $51 \neq 0$, so that use Euclid's division lemma

$a = 102$ $b = 51$

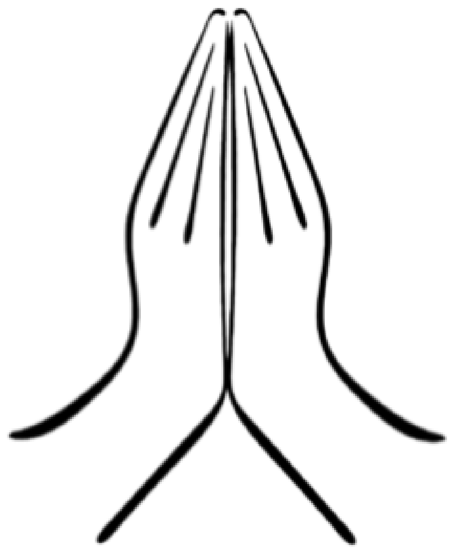
$$
\begin{array}{r}
2 \\
51\overline{)102} \\
-102 \\
\hline
0
\end{array}
$$

We have $r = 0$, so that our method stops here. Since, in the last step, the divisor is 51,

so that HCF = (867 , 255)

= 51

Thanks



For watching