LECTURE_02

MODULE_03

Q. Use Euclid's division Algorithm to find the HCF of :

(i) 184, 230, 276

Sol.

$$184 \overline{)\,230\,}\ \ 1$$
$$-184$$
$$46 \overline{)\,184\,}\ \ 4$$
$$-184$$
$$0$$

$$46 \overline{)\,276\,}\ \ 6$$
$$-276$$
$$0$$

$$230 = 184 \times 1 + 46$$

$$184 = 46 \times 4 + 0$$

$$276 = 46 \times 6 + 0$$

$\therefore$ $\boxed{\text{HCF }(184, 230, 276) = 46}$

DIVIDEND = DIVISOR × QUOTIENT + REMAINDER

Q. Use Euclid's division Algorithm to find the HCF of :

(ii) 136, 170, 255

Sol.

$$\begin{array}{r|l} & 1 \\ \hline 136 & 170 \\ & -136 \\ \hline & 34 \end{array} \qquad \begin{array}{r|l} & 4 \\ \hline 34 & 136 \\ & -136 \\ \hline & 0 \end{array}$$

$$\begin{array}{r|l} & 7 \\ \hline 34 & 255 \\ & -238 \\ \hline & 17 \end{array} \qquad \begin{array}{r|l} & 2 \\ \hline 17 & 34 \\ & -34 \\ \hline & 0 \end{array}$$

$170 = 136 \times 1 + 34$

$136 = 34 \times 4 + 0$

$255 = 34 \times 7 + 17$

$34 = 17 \times 2 + 0$

$\therefore$ $\boxed{\text{HCF } (136, 176, 255) = 17}$

DIVIDEND = DIVISOR × QUOTIENT + REMAINDER

MODULE_04

Exercise 1.1

Q.2. Show that any positive odd integer is of the form $6q + 1$ or $6q + 3$ or $6q + 5$ where q is some integer.

Sol. Let a be any positive odd integer and $b = 6$,

Applying Euclid's Division Algorithm,

we get

$a = 6q + r$ where $0 \leq r < 6$

$\therefore$ The possible remainders are 0, 1, 2, 3, 4, 5

$\therefore$ $\boxed{a = 6q}$ or $\boxed{6q + 1}$ or $\boxed{6q + 2}$ or $\boxed{6q + 3}$ or $\boxed{6q + 4}$ or $\boxed{6q + 5}$

since a is odd and q is some integer, we neglect

$6q$, $6q + 2$ and $6q + 4$, as they are even

$\therefore$ $a = 6q + 1$ or $6q + 3$ or $6q + 5$

$\therefore$ *Any positive odd integer is of the form $6q + 1$ or $6q + 3$ or $6q + 5$*

(+ve odd integers) $= 6q + 1$
$= 6q + 3$
$= 6q + 5$

+ve odd integer denoted as 'a'

a = bq + r

Possible values Of 'r' are

0, 1, 2, 3, 4, 5

0 ≤ r< b

But, b = 6

Here, divisor b is equal to 6

q is some integer

excluded

MODULE_05

Exercise 1.1

Q.3 An army contingent of 616 members is to march behind an army band of 32 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march?

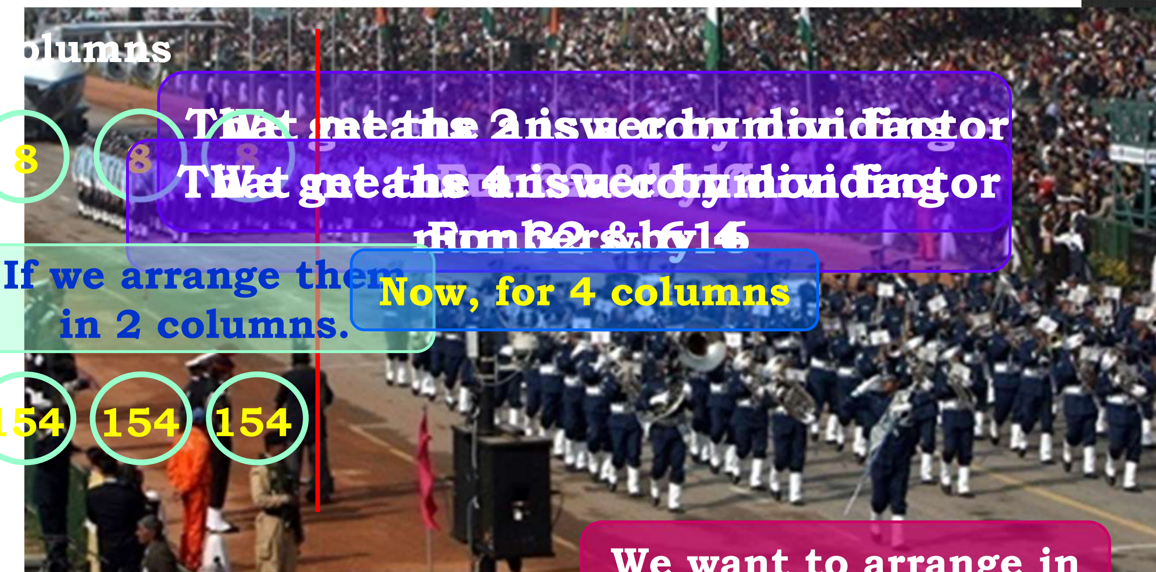
Sol.

16 16 8 8 8 8

308 308 154 154 154 154

If we arrange them in 2 columns.

Now, for 4 columns



We want to arrange in maximum column

That means find maximum i.e highest common factor for 32 & 616

Exercise 1.1

Q.3 **An army contingent of 616 members is to march behind an army band of 32 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march?**

Sol.

Dividend = Divisor × Question + Reminder

Applying Euclid's Division Algorithm,

$616 = 32 \times 19 + 8$

applying Euclid's Division Algorithm,

$32 = 8 \times 4 + 0$

$$
\begin{array}{r}
19 \\
32\overline{)616} \\
-\ 32 \\
\hline
296 \\
-\ 288 \\
\hline
8)\ 32\ (4 \\
-\ 32 \\
\hline
0
\end{array}
$$

$\therefore$ HCF (616, 32) = 8

$\therefore$ **Maximum number of columns in which they can march is 8.**

MODULE_06

Q **Show that every positive even integer is of the form $\boxed{2}q$, and that every positive odd integer is of the form $2q + 1$, where q is some integer.**

Sol.

By Euclid's algorithm,

$a = 2q + r,$