Exercise 1.1

Q.1) Use Euclid's division algorithm to find the HCF of:

(i) 135 and 225 (ii) 196 and 38220 (iii) 867 and 255

Sol.1) (i) 135 and 225

We start with the larger number 225

By Euclid's division algorithm, we have

225 = 1 × 135 + 90

135 = 1 × 90 + 45 = 2 × 45 + 0

HCF(225, 135) = HCF(135, 90) = HCF(90, 45) = 45

Therefore, the HCF of 135 & 225 is 45.

(ii) 196 and 38220

We start with the larger number 38220

By Euclid's division algorithm, we have

38220 = 196 × 195 + 0

we apply Euclid's Division Algorithm of divisor 196 & the remainder 0.

Therefore, 196 = 196 × 1 + 0

Therefore, HCF (38220, 196) = 196.

(iii) 867 and 255

Using Euclid's Division Algorithm

867 = 255 × 3 + 102

Applying Euclid's Division Algorithm on the divisor 225 & the remainder 102,

We have,

255 = 102 × 2 + 51

Again, applying Euclid's Division Algorithm on the Divisor 102 & the number 51.

102 = 51 × 2 + 0.

Therefore, HCF(867, 255) = HCF(255,102) = HCF(102,51) = 51.

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.2) Using Euclid's Division Algorithm, we have

$a = bq + r\{r \leq 0 < b\}$ .... (1)

Substituting $b = 6$ in equation (1)

$a = 6q + r$ where $r \leq 0 < 6 \Rightarrow r = 0, 1, 2, 3, 4, 5$

So total possible forms will $6q + 0$, $6q + 1$, $6q + 2$,$6q + 3$, $6q + 4$, $6q + 5$

$6q + 0$

6 is divisible by 2 so it is a even number

$6q + 1$

6 is divisible by 2 but 1 is not divisible by 2 so it is a odd number

$6q + 2$

6 is divisible by 2 and 2 is also divisible by 2 so it is a even number

$6q + 3$

6 is divisible by 2 but 3 is not divisible by 2 so it is a odd number

$6q + 4$

6 is divisible by 2 and 4 is also divisible by 2 it is a even number

$6q + 5$

6 is divisible by 2 but 5 is not divisible by 2 so it is a odd number

So odd numbers will in form of $6q + 1$, or $6q + 3$, or $6q + 5$.

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.3) For the above problem, the maximum no. of columns would be the HCF of 616 & 32

We can find the HCF of 616 & 32 by using Euclid's Division Algorithm.

Therefore,

$616 = 19 \times 32 + 8$

$32 = 4 \times 8 + 0$

$8 = 8 \times 1 + 0$

Therefore, HCF(616,32) = HCF of (32, 8) = 8

Therefore, the maximum number of columns in which they can march is 8.