Exercise 1.3

Question 9:

Using Euclid's division algorithm, find the largest number that divides 1251, 9377 and 15628 leaving remainders 1, 2 and 3 respectively.

Answer 9:

Since, 1, 2 and 3 are the remainders of 1251, 9377 and 15628, respectively. Thus, after subtracting these remainders from the numbers.

We have the numbers,

1251 – 1 = 1250,

9377 – 2 = 9375 and

15628 – 3 = 15625

Which is divisible by the required number.

Now, required number = HCF of 1250, 9375 and 15625

By Euclid's division algorithm

$a = bq + r\ ,\ 0 \leq r < b$ … (i)

[∵ dividend = divisor × quotient + remainder]

For largest number, put *a* = 15625 and *b* = 9375

$15625 = 9375 \times 1 + 6250$ $[\because r \neq 0]$

$\Rightarrow 9375 = 6250 \times 1 + 3125$ $[\because r \neq 0]$

$\Rightarrow 6250 = 3125 \times 2 + 0$

[Now $r = 0$]

∴ HCF (15625 and 9375) = 3125

Now, we take *c* = 1250 and *d* = 3125, then again using Euclid's division algorithm,

$d = cq + r,\quad 0 \leq r < c$

$\Rightarrow 3125 = 1250 \times 2 + 625$ $[\because r \neq 0]$

$\Longrightarrow 1250 = 625 \times 2 + 0$

[Now $r = 0$]

∴ HCF (1250, 9375 and 15625) = 625

Hence, 625 is the largest number which divides 1251, 9377 and 15628 leaving remainder 1, 2 and 3 respectively.