

Mathematics

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(Chapter – 1) (Real Numbers)(Exemplar Problems)
(Class – X)

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,

$$1251 - 1 = 1250,$$

$$9377 - 2 = 9375 \text{ and}$$

$$15628 - 3 = 15625$$

Which is divisible by the required number.

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

By Euclid's division algorithm

$$a = bq + r, 0 \leq r < b \quad \dots (i)$$

[∴ dividend = divisor × quotient + remainder]

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

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

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

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

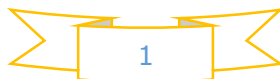
[Now $r = 0$]

$$\therefore \text{HCF} (15625 \text{ and } 9375) = 3125$$

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

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

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



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

[Now $r = 0$]

$$\therefore \text{HCF (1250, 9375 and 15625)} = 625$$

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

