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Public Central School
Std - X (2020-21)
Mathematics Home Assignment

Euclid's division Lemma

- * An algorithm is a series of well defined steps which gives a procedure for solving a type of problem.
- * A lemma is a proven statement used for proving another statement.
- * Euclid's division algorithm is a technique to compute the Highest common factor (HCF) of two given positive integers.
- * To obtain the HCF of two positive integers, say C and d , with $C > d$, follow the step below,
Step-1 - Apply Euclid's division lemma, to C and d , so we find whole number, q and r such that $C = dq + r$, $0 \leq r < d$
Step 2 - If $r = 0$, d is the HCF of C and d
If $r \neq 0$, apply the division lemma to d and r

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⇒ Decimal Expansions of Rational numbers

* Let x be a rational number whose decimal expansion terminating. Then we can express x in the form $\frac{p}{q}$, where p and q are coprime, and Prime factorization of q is of the form $2^n 5^m$, where n, m are non negative integers.

* Let $x = \frac{p}{q}$ be a rational number, such that Prime factorization of q is ~~not~~ of the form $2^n 5^m$, where n and m are non-negative integers. Then x has a decimal expansion which terminates.

* Let $x = \frac{p}{q}$ be a rational number, such that the Prime factorization of q is not of the form $2^n 5^m$ where n and m are non-negative integers. Then x has a decimal expansion which is non-terminating repeating.

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Step 3 - Continue the Process till the remainder is zero. The divisor at this stage will be the required HCF.

⇒ The Fundamental Theorem of Arithmetic

* Every composite number can be expressed as a product of primes, and this factorization is unique, apart from the order in which the prime factors occur.

⇒ Rational and Irrational Numbers

* A number 'S' is called rational if it can be written in the form $\frac{p}{q}$ where p and q are integers and $q \neq 0$

* A number S is called irrational if it cannot be written in the form of $\frac{p}{q}$ where p and q are integers and $q \neq 0$

⇒ Irrationality of square roots of 2, 3 and 5

* Let p be a prime number. If p divides a^2 then p divides a , where a is positive integer.

* $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$ are irrational numbers.