1
Chapter

Real Numbers

Key Points

1. **Euclid's division Lemma:**
For given positive integers 'a' and 'b' there exist unique whole numbers 'q' and 'r' satisfying the relation $a = bq + r$, $o \le r < b$

2. **Euclid's division algorithm:**
HCF of any two positive integers a and b with $a > b$ is obtained as follows:
Step 1 : Apply Euclid's division lemma to a and b to find q and r such that $a = bq + r$, $0 \le r < b$.
Step 2 : If $r = 0$ then HCF $(a, b) = b$; if $r \neq 0$ then again apply Euclid's lemma to b and r.
Repeat the steps till we get $r = 0$

3. **The fundamental Theorem of Arithmetic**
Every composite number can be expressed (factorized) as a product of primes and this factorization is unique, apart from the order in which the prime factors occur.

4. Let $x = \frac{p}{q}$, $q \neq 0$ to be a rational number, such that the prime factorization of 'q' is of the form $2^m 5^n$, where m, n are non-negative integers. Then x has a decimal expansion which is terminating.

5. Let $x = \frac{p}{q}$, $q \neq 0$ be a rational number, such that the prime factorization of q is not of the form $2^m 5^n$, where m, n are non-negative integers. Then x has a decimal expansion which is non-terminating repeating.