CBSE Class 10 Maths Notes Chapter 1: CBSE Class 10 Maths Chapter 1 Real Numbers Notes are detailed explanations provided here. Real numbers consists a broad spectrum of numbers, excluding complex numbers.

They include positive and negative integers, irrational numbers, and fractions, essentially any number encountered in the real world. Real numbers permeate our daily lives, whether in counting objects with natural numbers, measuring temperature with integers, representing fractions with rational numbers, or calculating square roots with irrational numbers.

In this chapter, we learn the essence of real numbers, exploring concepts such as Euclid's division algorithm, the fundamental theorem of arithmetic, methods for finding the Least Common Multiple (LCM) and Highest Common Factor (HCF), and a comprehensive understanding of rational and irrational numbers, elucidated with examples.

CBSE Class 10 Maths Notes Chapter 1 Real Numbers PDF

You can find the CBSE Class 10 Maths Notes for Chapter 1 on Real Numbers in PDF format by clicking on the link provided here. These notes explain important concepts like rational and irrational numbers, Euclid's division algorithm, and methods for finding LCM and HCF in a clear and easy-to-understand manner. They are helpful for students who want to improve their understanding of real numbers and build a strong foundation in mathematics.

CBSE Class 10 Maths Notes Chapter 1 Real Numbers PDF

CBSE Class 10 Maths Notes Chapter 1 Real Numbers

The answers for CBSE Class 10 Maths Notes Chapter 1 on Real Numbers are given below. This chapter explains important concepts like rational and irrational numbers, Euclid's division algorithm, and methods for finding LCM and HCF.

The solutions are provided in an easy-to-understand manner with clear explanations and examples. They are designed to help students understand the basics of real numbers better and improve their problem-solving skills in math.

Real Numbers

Real numbers consists a wide range of numerical values, including positive integers, negative integers, irrational numbers, and fractions. Essentially, any numerical value except for complex numbers can be classified as a real number. Examples of real numbers include -1, ½, 1.75, √2, and so on.

Real numbers consists both rational and irrational numbers. Each real number can be represented on the number line.

Euclid's Division Lemma

Euclid's Division Lemma states that when two integers, a and b, are given, there exists a unique pair of integers, q and r, satisfying the equation $a = b \times q + r$, where $0 \leq r < b$.

This lemma means: dividend equals divisor multiplied by quotient plus remainder.

In simpler terms, for any given pair of dividend and divisor, the obtained quotient and remainder will always be unique.

Euclid's Division Algorithm

- Euclid's Division Algorithm is a method used to find the **H.C.F** of two numbers, say *a* and *b* where $a > b$.
- We apply Euclid's Division Lemma to find two integers *q* and *r* such that $a=b\times q+r$ and $0\leq r<b$.
- If r = 0, the H.C.F is b; else, we apply Euclid's division Lemma to b (the divisor) and r (the remainder) to get another pair of quotient and remainder.
- The above method is repeated until a remainder of zero is obtained. The divisor in that step is the H.C.F. of the given set of numbers.

Fundamental Theorem of Arithmetic

- The Fundamental Theorem of Arithmetic states that the prime factorisation for a given number is unique if the arrangement of the prime factors is ignored.
- Example: $36=2\times2\times3\times3$ OR, $36=2\times3\times2\times3$
- Therefore, 36 is represented as a product of prime factors (Two 2s and two 3s) ignoring the arrangement of the factors.

Method of Finding LCM

The method of finding the Least Common Multiple (LCM) involves identifying the smallest of the common multiples of two or more numbers.

For instance, to determine the LCM of 36 and 56:

$36 = 2 \times 2 \times 3 \times 3$ $56 = 2 \times 2 \times 2 \times 7$

The common prime factors are 2×2, while the uncommon prime factors are 3×3 for 36 and 2×7 for 56.

By multiplying all the prime factors together, we get the LCM of 36 and 56, which is 2 × 2 × 3 × 3 × 2 × 7, equaling 504.

Method of Finding HCF

Finding the Highest Common Factor (HCF) of two or more numbers involves determining the greatest number that divides each of the given numbers without leaving any remainder.

There are two primary methods to find the HCF: Prime Factorisation and Euclid's Division Algorithm.

In the Prime Factorisation method, we express the given numbers as products of their respective prime factors. Then, we identify the prime factors that are common to both numbers.

For example, to find the HCF of 20 and 24: 20 = 2 × 2 × 5 and 24 = 2 × 2 × 2 × 3 The common factor is 2 × 2, which equals 4, thus the HCF of 20 and 24 is 4.

Alternatively, Euclid's Division Algorithm involves the repeated application of Euclid's division lemma to find the HCF of two numbers.

For example, to find the HCF of 18 and 30, we apply Euclid's division lemma repeatedly.

Product of Two Numbers = HCF X LCM of the Two Numbers

- For any **two** positive integers a and b,
  a×b=H.C.F×L.C.M.
- Example – For 36 and 56, the H.C.F is 4 and the L.C.M is 504
  36×56=2016
  4×504=2016
  Thus, 36×56=4×504
- Let us consider another example:
  For 5 and 6, the H.C.F is 1 and the L.C.M is 30
  5 × 6 = 30
  1 × 30 =30
  Thus, 5 × 6 = 1 × 30
- The above relationship, however, doesn't hold true for 3 or more numbers

Real Numbers for Class 10 Solved Examples

Example 1:

Find the largest number that divides 70 and 125 leaving the remainder 5 and 8 respectively.

Solution:

First, subtract the remainder from the number.

(i.e) 70-5 = 65

125-8 = 117.

Thus, we need to find the largest number that divides 65 and 117 and leaves the remainder 0.

To find the largest number, take the HCF of 65 and 117.

Finding HCF of 65 and 117.

65 = 5×13

117 = 3×3×13.

Hence, HCF (65, 117) = 13.

Therefore, the largest number that divides 70 and 125 leaving the remainder 5 and 8 respectively is 13.

Example 2:

Find the LCM of 306 and 657, given that HCF (306, 657) = 9.

Solution:

Given that, HCF (306, 657) = 9.

We know that HCF × LCM = Product of Numbers

Hence, 9×LCM = 306×657

9×LCM = 201042

LCM = 201042/9

LCM = 22338.

Therefore, LCM of 306 and 657 is 22338.

Example 3:

Prove that 1/√2 is an irrational number.

Solution:

To prove 1/√2 is an irrational number.

Now, let us take the opposite assumption.

(i.e) Take $1/\sqrt{2}$ is a rational number.

We know that rational numbers are the numbers that can be written in the form of p/q, where q is not equal to 0. (p and q are two co-prime numbers)

Hence, $1/\sqrt{2} = p/q$.

Now, simplify the above equation by multiplying $\sqrt{2}$ on both sides.

$1 = (p\sqrt{2})/q$

$q = p\sqrt{2}$

Hence, we get $q/p = \sqrt{2}$.

Here, p and q are integers, and hence q/p is a rational number.

But, $\sqrt{2}$ is an irrational number.

Hence, our assumption is wrong.

Therefore, $1/\sqrt{2}$ is an irrational number.

Hence, proved.