NCERT Solutions Class 9 Maths
Chapter 1: Number Systems
EXERCISE 1.1

Document Information:
Class: 9 | **Subject:** Mathematics | **Chapter:** 1 | **Exercise:** 1.1
Total Questions: 4 | **Academic Year:** 2025-26
Source: www.ncertbooks.net | **Generated:** February 21, 2026

Quick Summary: In NCERT Solutions Class 9 Maths Chapter 1 Exercise 1.1, students learn about rational and irrational numbers through fundamental classification and identification problems. This exercise covers the definition of rational numbers, finding rational numbers between given values, and understanding decimal expansions, which are essential building blocks for advanced number theory concepts in CBSE Class 9 and 10 exams.

Key Takeaways:

- A rational number can be expressed in the form (p)/(q) where p and q are integers and q ≠ 0
- Zero is a rational number as it can be written as (0)/(1), (0)/(2), etc.
- Between any two rational numbers, there exist infinitely many rational numbers using the mean method
- Natural numbers ⊂ Whole numbers ⊂ Integers ⊂ Rational numbers - understanding these number system hierarchies is crucial for classification problems

Complete Solutions

Question 1

QUESTION

Is zero a rational number? Can you write it in the form (p)/(q) where p and q are integers and q ≠ 0?

SOLUTION

The question asks whether zero is a rational number and if it can be expressed in the form , where and are integers and . This tests the understanding of the definition of rational numbers.

Step 1: Recall the definition of a rational number

A rational number is any number that can be expressed in the form , where and are integers, and is not equal to zero. The integer is the numerator, and the integer is the denominator.

Step 2: Consider zero as a fraction

We need to determine if zero can be written as a fraction with an integer numerator and a non-zero integer denominator. We can write zero as:

, , , , , and so on.

Step 3: Verify the conditions for a rational number

In each of these fractions, the numerator is 0, which is an integer. The denominator can be any non-zero integer (e.g., 1, 2, 3, -1, -2). Since the denominator is never zero, the condition is satisfied.

Step 4: Simplify the fractions

Any fraction with 0 as the numerator and a non-zero denominator simplifies to 0. For example:

, ,

Step 5: Conclude

Yes, zero is a rational number because it can be written in the form , where and are integers and . For example, . The denominator can also be a negative integer.

ANSWER

Yes. 0 = (0)/(1) = (0)/(2) = (0)/(3) etc. The denominator q can also be taken as a negative integer.

Question 2

QUESTION

Find six rational numbers between 3 and 4.

SOLUTION

We need to find six rational numbers between 3 and 4. The key idea here is to express 3 and 4 as equivalent rational numbers with a common denominator that allows us to easily insert six rational numbers in between.

Step 1: Determine the common denominator

Since we want to find six rational numbers between 3 and 4, we choose a denominator that is greater than 6. A convenient choice is 6 + 1 = 7. This ensures enough "space" between the two numbers when expressed as fractions.

Step 2: Convert 3 and 4 to equivalent fractions with the chosen denominator

We express 3 and 4 with the denominator 7:

Step 3: Identify the rational numbers between the two fractions

Now we need to find six rational numbers between and . We can simply increment the numerator by 1 for each subsequent rational number:

These six rational numbers lie between (which is 3) and (which is 4).

Final Answer: The six rational numbers between 3 and 4 are .

This method works because by choosing a denominator slightly larger than the number of rationals we want to find, we create enough fractional "slots" between our two original numbers to fit the required number of rational numbers. Any denominator larger than 7 would also work, leading to a different (but equally valid) set of rational numbers between 3 and 4.

ANSWER

One method is to write: 3 = (21)/(6+1) and 4 = (28)/(6+1). The six rational numbers are (22)/(7), (23)/(7), (24)/(7), (25)/(7), (26)/(7), (27)/(7).

Question 3

QUESTION

Find five rational numbers between (3)/(5) and (4)/(5).

SOLUTION

We are asked to find five rational numbers between and . To do this, we will convert the fractions to equivalent fractions with a larger denominator so that we can easily identify rational numbers between them.

Step 1: Find a common denominator

We need to find a common denominator for and . Since we want to find five rational numbers between them, we should aim for a denominator that is large enough to accommodate these numbers. Multiplying the numerator and denominator of both fractions by 10 will give us a large enough gap.

Step 2: Convert to equivalent fractions

Convert to an equivalent fraction:

Convert to an equivalent fraction:

Step 3: Identify rational numbers between the equivalent fractions

Now we need to find five rational numbers between and . We can simply choose any five numerators between 30 and 40, keeping the denominator as 50.

For example, we can choose 31, 32, 33, 34, and 35.

Step 4: List the rational numbers

The five rational numbers are:

Final Answer: The five rational numbers between and are .

ANSWER

Since (3)/(5) = (30)/(50) and (4)/(5) = (40)/(50), five rational numbers between them are: (31)/(50), (32)/(50), (33)/(50), (34)/(50), (35)/(50).

Question 4

QUESTION

State whether the following statements are true or false. Give reasons for your answers:

(i) Every natural number is a whole number.
(ii) Every integer is a whole number.
(iii) Every rational number is a whole number.

SOLUTION

This question tests our understanding of the definitions of natural numbers, whole numbers, integers, and rational numbers, and how these sets relate to each other.

(i) Every natural number is a whole number.

Step 1: Define Natural Numbers

Natural numbers are the counting numbers, starting from 1:

Step 2: Define Whole Numbers

Whole numbers include all natural numbers and zero:

Step 3: Compare the two sets

Since every natural number is also found in the set of whole numbers, the statement is true.

Final Answer: True, since the collection of whole numbers contains all the natural numbers.

(ii) Every integer is a whole number.

Step 1: Define Integers

Integers include all whole numbers and their negative counterparts:

Step 2: Define Whole Numbers (again for clarity)

Whole numbers include all natural numbers and zero:

Step 3: Compare the two sets

Integers include negative numbers, which are not whole numbers. For example, -1 is an integer but not a whole number.

Final Answer: False, for example is not a whole number.

(iii) Every rational number is a whole number.

Step 1: Define Rational Numbers

Rational numbers can be expressed in the form , where and are integers and .

Step 2: Define Whole Numbers (again for clarity)

Whole numbers include all natural numbers and zero:

Step 3: Compare the two sets

Rational numbers include fractions and decimals that are not integers. For example, is a rational number but not a whole number.

Final Answer: False, for example is a rational number but not a whole number.

ANSWER

(i) True, since the collection of whole numbers contains all the natural numbers.

(ii) False, for example -2 is not a whole number.

(iii) False, for example (1)/(2) is a rational number but not a whole number.

📚 Relevant Resources

Explore more NCERT solutions (click links to visit):

Resource	Visit Link
NCERT Class 9 Mathematics Textbook	Download Book →
NCERT Class 9 Science Solutions	View Solutions →
RD Sharma Class 9 (Updated 2025-26)	View Solutions →
NCERT Class 9 English (Beehive)	Download Book →

📝 Key Formulas

Important Formulas for Exercise 1.1

Formula / Concept	Description
Rational Numbers	A number is called rational if it can be expressed in the form (p)/(q), where p and q are integers and q ≠ 0.
Decimal Expansion of Rational Numbers	The decimal expansion of a rational number is either terminating (ends after a finite number of digits) or non-terminating recurring (a block of digits repeats indefinitely).
Irrational Numbers	

Formula / Concept	Description
	A number is called irrational if it cannot be expressed in the form (p)/(q), where p and q are integers and q ≠ 0.
Decimal Expansion of Irrational Numbers	The decimal expansion of an irrational number is non-terminating and non-recurring (the digits continue infinitely without forming a repeating pattern). Examples include √2, √3, π, etc.
Finding Rational Numbers Between Two Rational Numbers (Mean Method)	If a and b are two rational numbers, then (a+b)/(2) is a rational number that lies between a and b. This method can be applied repeatedly to find more rational numbers.
Finding Rational Numbers Between Two Rational Numbers (Equivalent Fraction Method)	To find rational numbers between two given rational numbers (say (a)/(b) and (c)/(d)), first make their denominators equal. If more numbers are needed, multiply both the numerator and denominator of each fraction by a suitable common factor (e.g., 10).
Converting Non-Terminating Recurring Decimals to (p)/(q) Form	To convert a non-terminating recurring decimal (e.g., 0.\overlinex, 0.\overlinexy, 0.a\overlineb) to (p)/(q) form, follow these steps: 1. Let x equal the given decimal. 2. Multiply x by a power of 10 such that the repeating part shifts to the left of the decimal point. 3. Multiply x by another power of 10 (if necessary) such that the non-repeating part (if any) is to the left of the decimal point, and the repeating part starts immediately after the decimal. 4. Subtract the equations to eliminate the repeating part. 5. Solve for x.

Top FAQs

Q1. How many questions are in NCERT Solutions Class 9 Maths Chapter 1 Number Systems Exercise 1.1 for CBSE 2025-26?

There are exactly 4 questions in NCERT Solutions for Class 9 Maths Chapter 1 Number Systems Exercise 1.1. These questions focus on identifying rational and irrational numbers with detailed step by step solutions provided for CBSE board exam 2025-26 preparation.

Q2. Where can I download free PDF of NCERT Solutions for Class 9 Maths Chapter 1 Number Systems Exercise 1.1 with step by step solutions?

You can download the free PDF of NCERT Solutions for Class 9 Maths Chapter 1 Number Systems Exercise 1.1 from official educational websites and trusted academic portals. These PDFs contain complete step by step solutions for all 4 questions aligned with CBSE syllabus 2025-26, helping students prepare effectively for board exams.

Q3. How many marks does Number Systems Chapter 1 carry in CBSE Class 9 Maths board exam 2025-26 syllabus?

Number Systems (Chapter 1) carries 10 marks weightage under Unit I in CBSE Class 9 Maths board exam 2025-26. This makes NCERT Solutions for Class 9 Maths Chapter 1 Exercise 1.1 crucial for scoring well, as it covers fundamental concepts of rational and irrational numbers that appear in board examinations.

Q4. Which is the most difficult question in Exercise 1.1 of NCERT Solutions Class 9 Maths Chapter 1 Number Systems?

Question 4 in Exercise 1.1 of NCERT Solutions for Class 9 Maths Chapter 1 Number Systems is considered most challenging as it involves classifying multiple numbers as rational or irrational. Students can refer to step by step solutions in free PDF download to understand the decimal expansion method and conceptual clarity needed for CBSE board exam 2025-26.

Q5. What is the difference between Rational and Irrational Numbers in NCERT Solutions Class 9 Maths Chapter 1 Exercise 1.1?

In NCERT Solutions for Class 9 Maths Chapter 1 Number Systems, rational numbers are those that can be expressed as p/q form with terminating or repeating decimal expansions, while irrational numbers have non-terminating non-repeating decimal expansions. Exercise 1.1 provides step by step solutions to identify these number types, which is important for CBSE board exam 2025-26.

More Exercises

Visit all exercises from Chapter 1:

EXERCISE 1.1 ✓ →

EXERCISE 1.2 →

EXERCISE 1.3 →

EXERCISE 1.4 →

EXERCISE 1.5 →

Complete Chapter: Class 9 Maths Ch 1: Number Systems →