RS Aggarwal Solutions for Class 10 Maths Chapter 1 Exercise 1.4: RS Aggarwal Solutions for Class 10 Maths Chapter 1, "Real Numbers," Exercise 1.4, provide detailed answers to help students understand the basic concepts of real numbers.

This exercise covers important topics like Euclid's Division Lemma, the Fundamental Theorem of Arithmetic, and how to find the Highest Common Factor (HCF) and Least Common Multiple (LCM). Each solution is explained step-by-step, making it easy for students to follow and learn.

By studying these solutions, students can improve their problem-solving skills and gain a solid understanding of important math concepts.

RS Aggarwal Solutions for Class 10 Maths Chapter 1 Exercise 1.4 Overview

The RS Aggarwal Solutions for Class 10 Maths Chapter 1, Exercise 1.4, are prepared by subject experts of Physics Wallah. These solutions explain the important concepts of real numbers in a simple and clear way. Topics like Euclid's Division Lemma, the Fundamental Theorem of Arithmetic, and methods for finding the Highest Common Factor (HCF) and Least Common Multiple (LCM) are covered.

Each solution is given step-by-step, making it easy for students to understand and learn. By using these solutions, students can improve their math skills and build a strong foundation for future studies.

RS Aggarwal Solutions for Class 10 Maths Chapter 1 Real Numbers Exercise 1.4 PDF

The RS Aggarwal Solutions for Class 10 Maths Chapter 1, Exercise 1.4 PDF prepared by subject experts of Physics Wallah, is a helpful resource for students.

Each solution is given step-by-step, making it easy for students to understand. Using these solutions can help students improve their math skills. You can find the PDF link below.

RS Aggarwal Solutions for Class 10 Maths Chapter 1 Real Numbers Exercise 1.4 PDF

RS Aggarwal Solutions for Class 10 Maths Chapter 1 Exercise 1.4

Here we have provided RS Aggarwal Solutions for Class 10 Maths Chapter 1 Exercise 1.4 for the ease of students so that they can prepare better for their exams.

Question 1.

Solution:

(i) Rational numbers: Numbers in the form of $\frac{p}{q}$ where p and q are integers and q ≠ 0, are called rational numbers.
(ii) Irrational numbers : The numbers which are not rationals, are called irrational numbers. Irrational numbers can be expressed in decimal form as non terminating non-repeating decimal.
(iii) Real numbers : The numbers which are rational or irrational, are called real numbers.

Question 2.

Solution:

(i) $\frac{22}{7}$
It is a rational number as it is in the form of $\frac{p}{q}$
(ii) 3.1416
It is a rational number as it is a terminating decimal.
(iii) π
It is an irrational number as it is nonterminating non-repeating decimal.
(iv) $3.142\overline{8}57$
It is a rational number as it is nonterminating repeating decimal.
(v) 5.636363… = 5.63
It is a rational number as it is nonterminating repeating decimal.
(vi) 2.040040004…
It is an irrational number as it is nonterminating non-repeating decimal.
(vii) 1.535335333…
It is an irrational number as it is non terminating non-repeating decimal.

(viii) 3.121221222…
It is an irrational number as it is nonterminating non-repeating decimal.
(ix) $\sqrt{21}$
It is an irrational number aS it is not in the form of $\frac{p}{q}$
(x) $\sqrt[3]{3}$
It is an irrational number as it is not in the form of $\frac{p}{q}$

Question 3.

Solution:
(i) $\sqrt{6}$ is irrational.
Let $\sqrt{6}$ is not an irrational number, but it is a rational number in the simplest form of $\frac{p}{q}$
$\sqrt{6} = \frac{p}{q}$(p and q have no common factors)
Squaring both sides,

$6 = \frac{p^2}{q^2}$
$p^2 = 6q^2$
p^2 is divisible by 6
=> p is divisible by 6
Let p = 6a for some integer a
$6q^2 = 36a^2$
=> $q^2 = 6a^2$
q^2 is also divisible by 6
=> q is divisible by 6
6 is common factors of p and q
But this contradicts the fact that p and q have no common factor
$\sqrt{6}$ is irrational

(ii) (2 – √3) is irrational
Let (2 – √3) is a rational and 2 is also rational, then
2 – (2 – √3) is rational (Difference two rationals is rational)
=> 2 – 2 + √3 is rational
=> √3 is rational
But it contradicts the fact
(2 – √3) is irrational
(iii) (3 + √2) is irrational
Let (3 + √2) is rational and 3 is also rational
(3 + √2) – 3 is rational (Difference of two rationals is rational)
=> 3 + √2 – 3 is rational
=> √2 is rational
But it contradicts the fact (3 + √2) is irrational
(iv) (2 + √5) is irrational
Let (2 + √5) is rational and 2 is also rational
(2 + √5) – 2 is rational (Difference of two rationals is rational)
=> 2 + √5 – 2 is rational
=> √5 is rational
But it contradicts the fact (2 + √5) is irrational
(v) (5 + 3√2) is irrational

Let (5 + 3√2) is rational and 5 is also rational
(5 + 3√2) – 5 is rational (Difference of two rationals is rational)
=>5 + 3√2 – 5 is rational
=> 3√2 is rational
Product of two rationals is rational
3 is rational and √2 is rational
√2 is rational
But it contradicts the fact
(5 + 3√2) is irrational
(vi) 3√7 is irrational
Let 3√7 is rational
3 is rational and √7 is rational (Product of two rationals is rational)
But √7 is rational, it contradicts the fact
3√7 is irrational
(vii) $\frac{3}{\sqrt{5}}$is irrational
Let $\frac{3}{\sqrt{5}}$is rational
$\frac{3\times\sqrt{5}}{\sqrt{5}\times\sqrt{5}}=\frac{3\sqrt{5}}{5}$is rational
$\frac{3}{5}$is rational and √5 is rational
But √5 is a rational, it contradicts the fact
$\frac{3}{\sqrt{5}}$is irrational
(viii)(2 – 3√5) is irrational
Let 2 – 3√5 is rational, 2 is also rational
2 – (2 – 3√5) is rational (Difference of two rationals is rational)
2 – 2 + 3√5 is rational
=> 3√5 is rational
3 is rational and √5 is rational (Product of two rationals is rational)
√5 is rational
But it contradicts the fact
(2 – 3√5) is irrational
(ix) (√3 + √5) is irrational
Let √3 + √5 is rational

Squaring,
$(\sqrt{3} + \sqrt{5})^2$ is rational
=> 3 x 5 + 2√3 x √5 is rational
=> 8 + 2√15 is rational
=> 8 + 2√15 – 8 is rational (Difference of two rationals is rational)
=> 2√15 is rational
2 is rational and √15 is rational (Product of two rationals is rational)
√15 is rational
But it contradicts the fact
(√3 + √5) is irrational

Question 4.

Solution:
Let $\frac{1}{\sqrt{3}}$ is rational
= $\frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3} = \frac{1}{3}\sqrt{3}$ is rational
$\frac{1}{3}$ is rational and √3 is rationals (Product of two rationals is rational)
√3 is rational But it contradicts the fact
$\frac{1}{\sqrt{3}}$ is irrational

Question 5.

Solution:
(i) We can take two numbers 3 + √2 and 3 – √2 which are irrationals
Sum = 3 + √2 + 3 – √2 = 6 Which is rational
3 + √2 and 3 – √2 are required numbers
(ii) We take two. numbers
5 + √3 and 5 – √3 which are irrationals
Now product = (5 + √3) (5 – √3)

$= (5)^2 - (\sqrt{3})^2 = 25 - 3 = 22$ which is rational
$5 + \sqrt{3}$ and $5 - \sqrt{3}$ are the required numbers

Question 6.

Solution:
(i) True.
(ii) True.
(iii) False, as sum of two irrational can be rational number also such as
$(3 + \sqrt{2}) + (3 - \sqrt{2}) = 3 + \sqrt{2} + 3 - \sqrt{2} = 6$ which is rational.
(iv) False, as product of two irrational numbers can be rational also such as
$(3 + \sqrt{2})(3 - \sqrt{2}) = (3)2 - (\sqrt{2})2 = 9 - 2 = 7$
which is rational
(v) True.
(vi) True.

Question 7.

Solution:
Let $(2\sqrt{3} - 1)$ is a rational number and 1 is a rational number also.
Then sum $= 2\sqrt{3} - 1 + 1 = 2\sqrt{3}$
In $2\sqrt{3}$, 2 is rational and $\sqrt{3}$ is rational (Product of two rational numbers is rational)
But $\sqrt{3}$ is rational number which contradicts the fact
$(2\sqrt{3} - 1)$ is an irrational.

Question 8.

Solution:
Let $4 - 5\sqrt{2}$ is a rational number and 4 is also a rational number
Difference of two rational number is a rational numbers
$4 - (4 - 5\sqrt{2})$ is rational
=> $4 - 4 + 5\sqrt{2}$ is rational
=> $5\sqrt{2}$ is rational
Product of two rational number is rational
5 is rational and $\sqrt{2}$ is rational
But it contradicts the fact that $\sqrt{2}$ is rational $\sqrt{2}$ is irrational
Hence, $4 - 5\sqrt{2}$ is irrational

Question 9.

Solution:
Let $(5 - 2\sqrt{3})$ is a rational number and 5 is also a rational number
Difference of two rational number is rational
$= 5 - (5 - 2\sqrt{3})$ is rational
$= 5 - 5 + 2\sqrt{3}$ or $2\sqrt{3}$ is rational
Product of two rational number is rational
2 is rational and $\sqrt{3}$ is rational
But it contradicts the fact
$(5 - 2\sqrt{3})$ is an irrational number.

Question 10.

Solution:
Let $5\sqrt{2}$ is a rational
Product of two rationals is a rational
5 is rational and $\sqrt{2}$ is rational

But it contradicts the fact
$5\sqrt{2}$ is an irrational.

Question 11.

Solution:
$\frac{2}{\sqrt{7}} = \frac{2\sqrt{7}}{\sqrt{7}\times\sqrt{7}} = \frac{2\sqrt{7}}{7} = \frac{2}{7}\sqrt{7}$
Let $\frac{2}{7}\sqrt{7}$ is a rational number, then
$\frac{2}{7}$ is rational and $\sqrt{7}$ is rational
But it contradicts the fact $\frac{2}{\sqrt{7}}$ is an irrational number.

Benefits of RS Aggarwal Solutions for Class 10 Maths Chapter 1 Exercise 1.4

- **Clear Explanations:** Each solution is explained in a simple and detailed manner, making it easier for students to understand complex concepts.
- **Step-by-Step Solutions:** The solutions are presented step-by-step, helping students follow the logical progression of each problem.
- **Enhanced Problem-Solving Skills:** By working through these solutions, students can improve their ability to solve mathematical problems efficiently.
- **Strong Foundation:** Understanding the concepts in this chapter helps build a strong foundation for future math topics and competitive exams.
- **Confidence Boost:** Practicing these solutions can boost students' confidence as they gain a better grasp of the material.
- **Exam Preparation:** These solutions are aligned with the curriculum and can be a valuable resource for exam preparation, ensuring that students are well-prepared for their tests.
- **Expert Guidance:** Prepared by subject experts, these solutions provide reliable and accurate answers, ensuring students learn the correct methods and techniques.
- **Convenient Access:** The solutions are available in PDF format, making it easy for students to access and study anytime, anywhere.