RD Sharma Solutions Class 10 Maths Chapter 1 Exercise 1.6: RD Sharma Solutions for Class 10 Maths Chapter 1 Exercise 1.6 provide a detailed approach to understanding real numbers and their applications. This exercise focuses on the concepts of Euclid's division lemma and its practical application in solving problems based on the divisibility of integers.

By working through Exercise 1.6 students strengthen their understanding of prime factorization, greatest common divisors and other foundational concepts that are essential for solving higher-level math problems. The detailed solutions in RD Sharma make each step easy to follow, helping students build confidence in handling complex numerical problems while preparing effectively for exams.

RD Sharma Solutions Class 10 Maths Chapter 1 Exercise 1.6 Overview

RD Sharma Solutions for Class 10 Maths Chapter 1 Exercise 1.6 created by subject experts of Physics Wallah provide students a thorough and easy-to-understand guide through the topic of real numbers.

With clear explanations and step-by-step methods Physics Wallah experts have created these solutions to make complex ideas accessible, boosting students problem-solving skills and confidence in handling mathematical concepts.

RD Sharma Solutions Class 10 Maths Chapter 1 Exercise 1.6 PDF

RD Sharma Solutions for Class 10 Maths Chapter 1 Exercise 1.6 PDF are created by subject experts at Physics Wallah provides detailed answers to questions on real numbers and the Euclidean algorithm. You can download the PDF using the link provided below which provide step-by-step explanations to help students understand and practice effectively:

RD Sharma Solutions Class 10 Maths Chapter 1 Exercise 1.6 PDF

RD Sharma Solutions for Class 10 Maths Chapter 1 Real Numbers Exercise 1.6

Here is the RD Sharma Solutions Class 10 Maths Chapter 1 Real Numbers Exercise 1.6-

1. Without actually performing the long division, state whether the following rational numbers will have a terminating decimal expansion or a non-terminating repeating decimal expansion.

(i) 23/8

Solution:

We have 23/8, and here the denominator is 8.

⇒ $8 = 2^3 \times 5$

We see that the denominator 8 of 23/8 is of the form $2^m \times 5^n$, where m and n are non-negative integers.

Hence, 23/8 has a terminating decimal expansion. And the decimal expansion of 23/8 terminates after three places of decimal.

(ii) 125/441

Solution:

We have 125/441, and here the denominator is 441.

⇒ $441 = 3^2 \times 7^2$

We see that the denominator 441 of 125/441 is not of the form $2^m \times 5^n$, where m and n are non-negative integers.

Hence, 125/441 has a non-terminating repeating decimal expansion.

(iii) 35/50

Solution:

We have 35/50, and here the denominator is 50.

⇒ $50 = 2 \times 5^2$

We see that the denominator 50 of 35/50 is of the form $2^m \times 5^n$, where m and n are non-negative integers.

Hence, 35/50 has a terminating decimal expansion. And the decimal expansion of 35/50 terminates after two places of decimal.

(iv) 77/210

Solution:

We have 77/210, and here the denominator is 210.

⇒ $210 = 2 \times 3 \times 5 \times 7$

We see that the denominator 210 of 77/210 is not of the form 2^m x 5^n, where m and n are non-negative integers.

Hence, 77/210 has a non-terminating repeating decimal expansion.

(v) 129/(2^2 x 5^7 x 7^{17})

Solution:

We have 129/(2^2 x 5^7 x 7^{17}), and here the denominator is 2^2 x 5^7 x 7^{17}.

Clearly,

We see that the denominator is not of the form 2^m x 5^n, where m and n are non-negative integers.

And hence, 125/441 has a non-terminating repeating decimal expansion.

(vi) 987/10500

Solution:

We have 987/10500

But, 987/10500 = 47/500 (reduced form)

And now the denominator is 500.

⇒ 500 = 2^2 x 5^3

We see that the denominator 500 of 47/500 is of the form 2^m x 5^n, where m and n are non-negative integers.

Hence, 987/10500 has a terminating decimal expansion. And the decimal expansion of 987/10500 terminates after three places of decimal.

2. Write down the decimal expansions of the following rational numbers by writing their denominators in the form of 2^m x 5^n, where m, and n, are the non-negative integers.

(i) 3/8

Solution:

The given rational number is 3/8

It's seen that, 8 = 2^3 is of the form 2^m x 5^n, where m = 3 and n = 0.

So, the given number has a terminating decimal expansion.

$$\frac{3\times5^3}{2^3\times5^3}=\frac{3\times125}{(2\times5)^3}=\frac{375}{(10)^3}=\frac{375}{1000}=0.375$$

∴

(ii) 13/125

Solution:

The given rational number is 13/125.

It's seen that, 125 = 5^3 is of the form 2^m x 5″, where m = 0 and n = 3.

So, the given number has a terminating decimal expansion.

∴ 13/ 125 = (13 x 2^3)/ (125 x 2^3) = 104/1000 = 0.104

(iii) 7/80

Solution:

The given rational number is 7/80.

It's seen that, 80 = 2^4 x 5 is of the form 2^m x 5^n, where m = 4 and n = 1.

So, the given number has a terminating decimal expansion.

$$\therefore\frac{7}{80}=\frac{7\times5^3}{2^4\times5\times5^3}=\frac{7\times125}{(2\times5)^4}=\frac{875}{10^4}=\frac{875}{10000}=0.0875$$

(iv) 14588/625

Solution:

The given rational number is 14588/625.

It's seen that, 625 = 5^4 is of the form 2^m x 5^n, where m = 0 and n = 4.

So, the given number has a terminating decimal expansion.

$$\therefore\frac{14588}{625}=\frac{14588\times2^4}{2^4\times5^4}=\frac{14588}{5^4}=23.3408$$

(v) 129/(2^2 x 5^7)

Solution:

The given number is 129/(2^2 x 5^7).

It's seen that, $2^2 \times 5^7$ is of the form $2^m \times 5^n$, where m = 2 and n = 7.

So, the given number has a terminating decimal expansion.

$$\therefore \frac{129}{2^2\times5^7} = \frac{129\times2^5}{2^2\times5^7\times2^5} = \frac{129\times32}{(2\times5)^7} = \frac{4182}{10^7} = \frac{4128}{10000000} = 0.0004182$$

3. Write the denominator of the rational number 257/5000 in the form $2^m \times 5^n$, where m and n are non-negative integers. Hence, write the decimal expansion without actual division.

Solution:

The denominator of the given rational number is 5000.

$\Rightarrow 5000 = 2^3 \times 5^4$

It's seen that, $2^3 \times 5^4$ is of the form $2^m \times 5^n$, where m = 3 and n = 4.

$\therefore$ 257/5000 = (257 x 2)/(5000 x 2) = 514/10000 = 0.0514 is its decimal expansion.

4. What can you say about the prime factorisation of the denominators of the following rational numbers:

(i) 43.123456789

Solution:

Since 43.123456789 has a terminating decimal expansion, its denominator is of the form $2^m \times 5^n$, where m and n are non-negative integers.

(ii)

$43.\overline{123456789}$

Solution:

Since the given rational has a non-terminating decimal expansion, its denominator has factors other than 2 or 5.

(iii) $27.\overline{142857}$

Solution:

Since the given rational number has a non-terminating decimal expansion, its denominator has factors other than 2 or 5.

(iv) 0.12012001200012000….

Solution:

Since 0.12012001200012000…. has a non-terminating decimal expansion, its denominator has factors other than 2 or 5.

5. A rational number in its decimal expansion is 327.7081. What can you say about the prime factors of q when this number is expressed in the form p/q? Give reasons.

Solution:

Since 327.7081 has a terminating decimal expansion, its denominator should be of the form 2^m x 5^n, where m and n are non-negative integers.

Further,

327.7081 can be expressed as 3277081/10000 = p/q

⇒ q = 10000 = 2^3 x 5^3

Hence, the prime factors of q have only factors of 2 and 5.

Benefits of Solving RD Sharma Solutions Class 10 Maths Chapter 1 Exercise 1.6

Here are the benefits of solving RD Sharma Solutions for Class 10 Maths, Chapter 1 Exercise 1.6:

Deepens Understanding of Real Numbers: This exercise focuses on the properties and applications of real numbers, helping students strengthen their understanding of foundational concepts.

Builds Problem-Solving Skills: By working through a variety of problems, students improve their analytical and logical reasoning skills.

Prepares for Board Exams: The solutions are aligned with the Class 10 board syllabus, making them ideal for exam preparation and boosting confidence.

Offers Step-by-Step Explanations: Each solution is explained in detail guiding students through complex problems and making learning easier.

Develops Accuracy and Speed: Regular practice with these exercises can improve calculation accuracy and help students solve problems more efficiently.

Boosts Self-Confidence: Completing exercises increases students confidence in their math abilities, preparing them for more advanced topics.