RD Sharma Solutions Class 10 Maths Chapter 1 Exercise 1.4: RD Sharma Solutions for Class 10 Maths Chapter 1 Exercise 1.4 provide a detailed guide to understanding and solving problems related to real numbers. This exercise focuses on various concepts, including the properties of rational and irrational numbers, and how to represent them on the number line.

Students will find step-by-step methods to tackle each problem making it easier to grasp the underlying mathematical principles. These solutions not only enhance problem-solving skills but also build a strong foundation for future mathematical concepts helping students in their preparation for exams.

RD Sharma Solutions Class 10 Maths Chapter 1 Exercise 1.4 Overview

RD Sharma Solutions for Class 10 Maths Chapter 1 Exercise 1.4 provide a clear understanding of real numbers focusing on their types and characteristics.

This exercise not only helps students learn the topic well but also boosts their confidence in solving math problems. With detailed explanations and examples these solutions are a great resource for students who want to do well in their math studies.

RD Sharma Solutions Class 10 Maths Chapter 1 Exercise 1.4 PDF

RD Sharma Solutions for Class 10 Maths Chapter 1 Exercise 1.4 PDF provides detailed answers and explanations for various problems related to real numbers. This resource is created to help students understand the concepts better and improve their problem-solving skills.

You can access the PDF link below to download the solutions and enhance your learning experience in mathematics.

RD Sharma Solutions Class 10 Maths Chapter 1 Exercise 1.4 PDF

RD Sharma Solutions Class 10 Maths Chapter 1 Real Numbers Exercise 1.4

Here is the RD Sharma Solutions Class 10 Maths Chapter 1 Real Numbers Exercise 1.4 -

1. Find the LCM and HCF of the following pairs of integers and verify that LCM × HCF = Product of the integers:

(i) 26 and 91

Solution:

Given integers are: 26 and 91

First, find the prime factors of 26 and 91.

$26 = 2 \times 13$

$91 = 7 \times 13$

∴ LCM (26, 91) = $2 \times 7 \times 13 = 182$

And,

HCF (26, 91) = 13

Verification:

LCM × HCF = 182 x 13= 2366

And, product of the integers = 26 x 91 = 2366

∴ LCM × HCF = product of the integers

Hence verified.

(ii) 510 and 92

Solution:

Given integers are: 510 and 92

First, find the prime factors of 510 and 92.

$510 = 2 \times 3 \times 5 \times 17$

$92 = 2 \times 2 \times 23$

∴ LCM (510, 92) = $2 \times 2 \times 3 \times 5 \times 23 \times 17 = 23460$

And,

HCF (510, 92) = 2

Verification:

LCM × HCF = 23460 x 2 = 46920

And, product of the integers = 510 x 92 = 46920

∴ LCM × HCF = product of the integers

Hence verified.

(iii) 336 and 54

Solution:

Given integers are: 336 and 54

First, find the prime factors of 336 and 54.

336 = 2 × 2 × 2 × 2 × 3 × 7

54 = 2 × 3 × 3 x 3

∴ LCM (336, 54) = 2 × 2 × 2 × 2 × 3 × 3 × 3 × 7 = 3024

And,

HCF (336, 54) = 2 x 3 = 6

Verification:

LCM × HCF = 3024 x 6 = 18144

And, product of the integers = 336 x 54 = 18144

∴ LCM × HCF = product of the integers

Hence verified.

2. Find the LCM and HCF of the following integers by applying the prime factorisation method:

(i) 12, 15 and 21

Solution:

First, find the prime factors of the given integers: 12, 15 and 21

For, 12 = 2 × 2 × 3

15 = 3 × 5

21 = 3 × 7

Now, LCM of 12, 15 and 21 = 2 × 2 × 3 × 5 × 7

∴ LCM (12, 15, 21) = 420.

And, HCF (12, 15 and 21) = 3.

(ii) 17, 23 and 29

Solution:

First, find the prime factors of the given integers: 17, 23 and 29

For, 17 = 1 × 17

23 = 1 × 23

29 = 1 × 29

Now, LCM of 17, 23 and 29 = 1 × 17 × 23 × 29

∴ LCM (17, 23, 29) = 11339.

And, HCF (17, 23 and 29) = 1.

(iii) 8, 9 and 25

Solution:

First, find the prime factors of the given integers: 8, 9 and 25

For, 8 = 2 × 2 x 2

9 = 3 × 3

25 = 5 × 5

Now, LCM of 8, 9 and 25 = $2^3 \times 3^2 \times 5^2$

∴ LCM (8, 9, 25) = 1800.

And, HCF (8, 9 and 25) = 1.

(iv) 40, 36 and 126

Solution:

First, find the prime factors of the given integers: 40, 36 and 126

For, 40 = 2 x 2 x 2 × 5

36 = 2 x 2 x 3 x 3

126 = 2 × 3 × 3 × 7

Now, LCM of 40, 36 and 126 = $2^3 \times 3^2 \times 5 \times 7$

∴ LCM (40, 36, 126) = 2520.

And, HCF (40, 36 and 126) = 2.

(v) 84, 90 and 120

Solution:

First, find the prime factors of the given integers: 84, 90 and 120

For, 84 = 2 × 2 × 3 × 7

90 = 2 × 3 × 3 × 5

120 = 2 × 2 × 2 × 3 × 5

Now, LCM of 84, 90 and 120 = $2^3 \times 3^2 \times 5 \times 7$

∴ LCM (84, 90, 120) = 2520.

And, HCF (84, 90 and 120) = 6.

(vi) 24, 15 and 36

Solution:

First, find the prime factors of the given integers: 24, 15 and 36

For, 24 = 2 × 2 x 2 x 3

15 = 3 × 5

36 = 2 × 2 × 3 × 3

Now, LCM of 24, 15 and 36 = 2 × 2 × 2 × 3 × 3 × 5 = $2^3 \times 3^2 \times 5$

∴ LCM (24, 15, 36) = 360.

And, HCF (24, 15 and 36) = 3.

3. Given that HCF (306, 657) = 9, find LCM (306, 657).

Solution:

Given two integers are: 306 and 657

We know that,

LCM × HCF = Product of the two integers

⇒ LCM = **Product of the two integers / HCF**

= (306 x 657) / 9 = 22338.

4. Can two numbers have 16 as their HCF and 380 as their LCM? Give reason.

Solution:

On dividing 380 by 16, we get

23 as the quotient and 12 as the remainder.

Now, since the LCM is not exactly divisible by the HCF, it can be said that two numbers cannot have 16 as their HCF and 380 as their LCM.

5. The HCF of the two numbers is 145, and their LCM is 2175. If one number is 725, find the other.

Solution:

The LCM and HCF of the two numbers are 145 and 2175, respectively. (Given)

It is also given that one of the numbers is 725

We know that,

LCM × HCF = first number × second number

2175 × 145 = 725 × second number

⇒ Second number = (2175 × 145)/ 725 = 435

∴ The other number is 435.

6. The HCF of the two numbers is 16, and their product is 3072. Find their LCM.

Solution:

Given,

HCF of two numbers = 16

And, their product = 3072

We know that,

LCM × HCF = Product of the two numbers

LCM × 16 = 3072

⇒ LCM = 3072/ 16 = 192

∴ The LCM of the two numbers is 192.

7. The LCM and HCF of the two numbers are 180 and 6, respectively. If one of the numbers is 30, find the other number.

Solution:

Given,

The LCM and HCF of the two numbers are 180 and 6, respectively. (Given)

It is also given that one of the numbers is 30.

We know that,

LCM × HCF = first number × second number

180 × 6 = 30 × second number

⇒ Second number = (180 × 6)/ 30 = 36

∴ The other number is 36.

8. Find the smallest number that, when increased by 17, is exactly divisible by both 520 and 468.

Solution:

First, let's find the smallest number, which is exactly divisible by both 520 and 468.

That is simply just the LCM of the two numbers.

By prime factorisation, we get

$520 = 2^3 \times 5 \times 13$

$468 = 2^2 \times 3^2 \times 13$

∴ LCM (520, 468) = $2^3 \times 3^2 \times 5 \times 13 = 4680$.

Hence, 4680 is the smallest number which is exactly divisible by both 520 and 468, i.e., we will get a remainder of 0 in each case. But, we need to find the smallest number, which, when increased by 17, is exactly divided by 520 and 468.

So that is found by,

4680 – 17 = 4663

∴ 4663 should be the smallest number which, when increased by 17, is exactly divisible by both 520 and 468.

9. Find the smallest number which leaves remainders 8 and 12 when divided by 28 and 32, respectively.

Solution:

First, let's find the smallest number, which is exactly divisible by both 28 and 32.

Which is simply just the LCM of the two numbers.

By prime factorisation, we get

$28 = 2 \times 2 \times 7$

$32 = 2^5$

∴ LCM (28, 32) = $2^5 \times 7 = 224$

Hence, 224 is the smallest number which is exactly divisible by 28 and 32, i.e., we will get a remainder of 0 in each case. But, we need the smallest number, which leaves remainders 8 and 12 when divided by 28 and 32, respectively.

So that is found by,

224 – 8 – 12 = 204

∴ 204 should be the smallest number which leaves remainders 8 and 12 when divided by 28 and 32, respectively.

10. What is the smallest number that, when divided by 35, 56 and 91, leaves remainders of 7 in each case?

Solution:

First, let's find the smallest number, which is exactly divisible by all 35, 56 and 91.

Which is simply just the LCM of the three numbers.

By prime factorisation, we get

$35 = 5 \times 7$

$56 = 2^3 \times 7$

$91 = 13 \times 7$

$\therefore$ LCM (35, 56 and 91) = $2^3 \times 7 \times 5 \times 13 = 3640$

Hence, 3640 is the smallest number that, when divided by 35, 56 and 91, leaves the remainder of 7 in each case.

So that is found by,

$3640 + 7 = 3647$

$\therefore$ 3647 should be the smallest number that, when divided by 35, 56 and 91, leaves the remainder of 7 in each case.

11. A rectangular courtyard is 18m 72cm long and 13m 20 cm broad. It is to be paved with square tiles of the same size. Find the least possible number of such tiles.

Solution:

Given,

Length of courtyard = 18 m 72 cm = 1800 cm + 72 cm = 1872 cm ($\because$ 1 m = 100 cm)

Breadth of courtyard = 13 m 20 cm = 1300 cm + 20 cm = 1320 cm

The size of the square tile needed to be paved on the rectangular yard is equal to the HCF of the length and breadth of the rectangular courtyard.

Now, finding the prime factors of 1872 and 1320, we have

$1872 = 2^4 \times 3^2 \times 13$

$1320 = 2^3 \times 3 \times 5 \times 11$

⇒ HCF (1872 and 1320) = $2^3 \times 3 = 24$

∴ The length of the side of the square tile should be 24 cm.

Thus, the number of tiles required = (area of the courtyard) / (area of a square tile)

We know that the area of the courtyard = Length × Breadth

= 1872 cm × 1320 cm

And, area of a square tile = $(\text{side})^2 = (24\text{cm})^2$

⇒ the number of tiles required = $(1872 \times 1320) / (24)^2 = 4290$

Thus, the least possible number of tiles required is 4290.

12. Find the greatest number of 6 digits exactly divisible by 24, 15 and 36.

Solution:

We know that the greatest 6-digit number is 999999.

Let's assume that 999999 is divisible by 24, 15 and 36 exactly.

Then, the LCM (24, 15 and 36) should also divide 999999 exactly.

Finding the prime factors of 24, 15, and 36, we get

24 = 2 × 2 × 2 × 3

15 = 3 × 5

36 = 2 × 2 × 3 × 3

⇒ LCM of 24, 15 and 36 = 360

Since, (999999)/ 360 = 2777 × 360 + 279

Here, the remainder is 279.

So, the greatest number which is divisible by all three should be = 999999 – 279 = 999720

∴ 999720 is the greatest 6-digit number which is exactly divisible by 24, 15 and 36.

13. Determine the number nearest to 110000 but greater than 100000, which is exactly divisible by each of 8, 15 and 21.

Solution:

First, let's find the LCM of 8, 15 and 21.

By prime factorisation, we have

8 = 2 × 2 × 2

15 = 3 × 5

21 = 3 × 7

⇒ LCM (8, 15 and 21) = 2^3 × 3 × 5 × 7 = 840

When 110000 is divided by 840, the remainder that is obtained is 800.

So, 110000 – 800 = 109200 should be divisible by each of 8, 15 and 21.

Also, we have 110000 + 40 = 110040 is also divisible by each of 8, 15 and 21.

⇒ 109200 and 110040 both are greater than 100000, but 110040 is greater than 110000.

Hence, 109200 is the number nearest to 110000 and greater than 100000, which is exactly divisible by each of 8, 15 and 21.

14. Find the least number that is divisible by all the numbers between 1 and 10 (both inclusive).

Solution:

From the question, it's understood that

The LCM of 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 will be the least number that is divisible by all the numbers between 1 and 10.

Hence, the prime factors of all these numbers are:

1 = 1

2 = 2

3 = 3

4 = 2 × 2

5 = 5

6 = 2 × 3

7 = 7

$8 = 2 \times 2 \times 2$

$9 = 3 \times 3$

$10 = 2 \times 5$

⇒ LCM will be = $2^3 \times 3^2 \times 5 \times 7 = 2520$

Hence, 2520 is the least number that is divisible by all the numbers between 1 and 10 (both inclusive).

15. A circular field has a circumference of 360 km. Three cyclists start together and can cycle 48,60 and 72 km a day around the field. When will they meet again?

Solution:

In order to calculate the time taken before they meet again, we must first find out the individual time taken by each cyclist to cover the total distance.

The number of days a cyclist takes to cover the circular field = (Total distance of the circular field) / (distance covered in 1 day by a cyclist).

So, for the 1st cyclist, number of days = 360 / 48 = 7.5 which is = 180 hours [∵1 day = 24 hours]

2nd cyclist, number of days = 360 / 60 = 6 which is = 144 hours

3rd cyclist, number of days = 360 / 72 = 5 which is 120 hours

Now, by finding the LCM (180, 144 and 120), we'll get to know after how many hours the three cyclists meet again.

By prime factorisation, we get

$180 = 2^2 \times 3^2 \times 5$

$144 = 2^4 \times 3^2$

$120 = 2^3 \times 3 \times 5$

⇒ LCM (180, 144 and 120) = $2^4 \times 3^2 \times 5 = 720$

So, this means that after 720 hours, the three cyclists meet again.

⇒ 720 hours = 720 / 24 = 30 days [∵1 day = 24 hours]

Thus, all three cyclists will meet again after 30 days.

16. In a morning walk, three persons step off together, their steps measuring 80 cm, 85 cm and 90 cm, respectively. What is the minimum distance each should walk so that he can cover the distance in complete steps?

Solution:

From the question, it's understood that the required distance each should walk would be the LCM of the measures of their steps, i.e., 80 cm, 85 cm, and 90 cm.

So, by finding LCM (80, 85 and 90) by prime factorisation, we get

$80 = 2^4 \times 5$

$85 = 17 \times 5$

$90 = 2 \times 3 \times 3 \times 5$

$\Rightarrow$ LCM (80, 85 and 90) = $2^4 \times 3^2 \times 5 \times 17$ = 12240 cm = 122m 40 cm [∵ 1 m = 100 cm]

Hence, 122 m 40 cm is the minimum distance that each should walk so that all can cover the same distance in complete steps.

Benefits of Solving RD Sharma Solutions Class 10 Maths Chapter 1 Exercise 1.4

Here are some benefits of solving RD Sharma Solutions for Class 10 Maths Chapter 1 Exercise 1.4:

Clear Understanding: The solutions provide step-by-step explanations that help students grasp the concepts of real numbers clearly making it easier to understand complex topics.

Practice Opportunities: This exercise provide a variety of problems that enable students to practice different types of questions reinforcing their learning and enhancing their problem-solving skills.

Concept Reinforcement: Working through the solutions allows students to reinforce their knowledge and apply what they've learned in class to solve problems independently.

Preparation for Exams: The exercise is aligned with the curriculum making it a useful resource for exam preparation. It helps students become familiar with the question formats and types they may encounter in their exams.

Error Analysis: By comparing their answers with the provided solutions students can identify mistakes and learn how to correct them, leading to a better understanding of the material.