Cosmo School

Class – 7

Chapter – 1(Rational and Irrational Number)

Lecture sheet – 9

Creative Question (Solution)

Exercise

1. 384 and 2187 are two numbers.

a) Verify with factors whether the first number be perfect square number.

b) If the second number is not perfect square number, what is the least number to be multiplied to get a perfect square number? What is the perfect square number?

c) What is the best number to be added to the second number so that the total sum is a perfect square number?

2. An army team can be arranged in 4, 5, 9 rows but they cannot be arranged in a square shape.

a) What are the factors of 9?

b) By which smallest number the total number of the soldiers should be multiplied to arrange the army in a square?

c) At least how many soldiers should join the troop to arrange them in a square?

3. The monthly expenditure of each students of a hostel is ten times of the number of students living in that hostel. Monthly expenditure is Tk. 9000 in that hostel.

a) Consider the number of students is x, express the monthly expenditure in terms as x.

b) Find the number of students of that hostel.

c) At least how many students should be left to arrange them in a square?

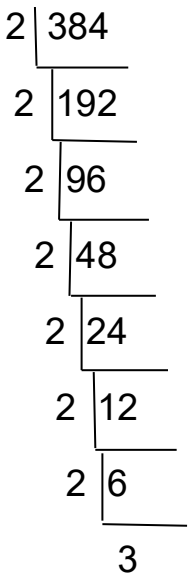
4. A farmer has 535 mango trees and 1156 coconut trees. He wants to plant equal number of trees along the length and the width of the garden.

a) How many trees does the farmer have?

b) If he plants coconut trees in his garden, find the number of coconut trees in each row.

c) How many more mango trees will he require to plant equally in each row along length and width?

1. a)

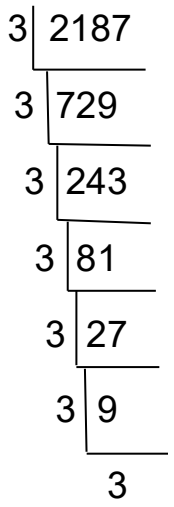


$\therefore 384 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 = (2 \times 2) \times (2 \times 2) \times (2 \times 2) \times 2 \times 3$

Since 2 and 3 have no pair, so 384 is not a perfect square number.

Ans : 384 is not a perfect square number.

b)



$\therefore 2187 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 = (3 \times 3) \times (3 \times 3) \times (3 \times 3) \times 3$

Since 3 has no pair, so 2187 is not a perfect square number. Hence, by multiplying with at least 3 would make the number a perfect square number.

Ans : 3.

c) 4 | 21 87 (46

16

86 | 5 87

5 16

71

We observe here that, $(46)^2 < 2187 < (47)^2$

The required number to be added = $(47)^2$ - 2187

= (47 × 47) – 2187

= 2209 – 2187 = 22

Ans : 22.

2. a) 3 | 9

3

Here, 9 = 1 × 9

= 3 × 3

∴ Factors of 9 = 1, 3, 9

Ans : 1, 3, 9

b) L.C.M of 4, 5, 9 = 4 × 5 × 9

Here, 4, 5 and 9 have no pair. Hence, by multiplying with at least 4 × 5 × 9 =180 would make the number a perfect square number.

Ans : 180 soldiers.

c) L.C.M of 4, 5, 9 = $4 \times 5 \times 9 = 180$

Now,

$$
\begin{array}{r|l}
1 & 1\ \overline{80}\ (\ 13 \\
 & 1 \\
\cline{2-2}
23 & 80 \\
 & 69 \\
\cline{2-2}
 & 11
\end{array}
$$

We observe here that, $(13)^2 < 180 < (14)^2$

The required number of soldiers to be added = $(14)^2 - 180$

$= (14 \times 14) - 180$

$= 196 - 180 = 16$

Ans : 16 soldiers.

3. a) Given,

The number of students = x

Monthly cost of each students = 10x

∴ Total cost = $10x \times x = 10x^2$

Ans : $10x^2$.

b) From 'a' we get, Total cost = $10x^2$

ATQ,

$10x^2 = 9000$

Or, $x^2 = 9000 \div 10$

Or, $x^2 = 900$

Or, $x = \sqrt{900}$

Or, $x = 30$

∴ The number of students = 30

Ans : 30 students.

c)

$$\begin{array}{r|l} 5 & \overline{30}\ (\ 5 \\ & 25 \\ \hline & 5 \end{array}$$

Here, remainder 5, so 30 is not a perfect square number.

If 5 students left from the hostel then the number of students can be arranged in a square.

∴ 5 students should be omitted.

Ans : 5 students.

4. a) Total trees = 535 + 1156 = 1691

Ans : 1691 trees.

b)

$$\begin{array}{r|l} 3 & \overline{11}\ \overline{56}\ (\ 34 \\ & 9 \\ \hline 64 & 2\ 56 \\ & 2\ 56 \\ \hline & 0 \end{array}$$

Here, 1156 is a perfect square number.

∴ The number of coconut trees in each row is 34.

Ans : 34 coconut trees.

c)

$$\begin{array}{r|l} 2 & 5\,\overline{35}\ (\ 23 \\ & 4 \\ \hline 43 & 1\,35 \\ & 1\,29 \\ \hline & \quad 6 \end{array}$$

Here, 535 is not a perfect square number.

We observe here that, $(23)^2 < 535 < (24)^2$

The required number of soldiers to be added = $(24)^2 - 535$

$= (24 \times 24) - 535$

$= 676 - 535 = 41$

Ans : More 41 mango trees are needed.