Exercise 3.5

1. Find LCM of following numbers by prime factorisation method:-

   (i) 45, 60 (ii) 52, 56 (iii) 96, 360

   (iv) 36, 96, 180 (v) 18, 42, 72

2. Find LCM of the following by common division method:-

   (i) 24, 64 (ii) 42, 63 (iii) 108, 135, 162

   (iv) 16, 18, 48 (v) 48, 72, 108

3. Find the smallest number which is divisible by 6, 8 and 10.
4. Find the least number when divided by 10, 12 and 15 leaves remainder 7 in each case.
5. Find the greatest 4-digit number exactly divisible by 12, 18 and 30.
6. Find the smallest 4-digit number exactly divisible by 15, 24 and 36.
7. Four bells toll at intervals of 4, 7, 12 and 14 seconds.The bells toll together at 5a.m. When will they again toll together?
8. Three boys step off together from the same spot their steps measures 56cm, 70cm and 63cm respectively. At what distance from the starting point will they again step together?
9. Can two numbers have 15 as their HCF and 65 as their LCM. Give reasons in support of your answer.
10. Can two numbers have 12 as their HCF and 72 as their LCM. Give reasons in support of your answer.
11. The HCF and LCM of two numbers are 13 and 182 respectively. If one of the numbers is 26. Find other number.
12. The LCM of two co-prime numbers is 195. If one number is 15 then find the other number.
13. The HCF of two numbers is 6 and product of two numbers is 216. Find their LCM.

Scanned with CamScanner

Exercise – 3.5

1. Find LCM of the following numbers by prime factorisation method.

(i) 45, 60

3	45
3	15
5	5
	1

2	60
2	30
3	15
5	5
	1

$\therefore 45 = 3 \times 3 \times 5$

$60 = 2 \times 2 \times 3 \times 5$

In these prime factorisation, 3 and 2 occurs maximum two times, 5 occurs maximum once

$\therefore$ LCM of 45 and 60 $= 3 \times 3 \times 2 \times 2 \times 5 = 180$ Ans.

(ii) 52, 56

2	52
2	26
13	13
	1

2	56
2	28
2	14
7	7
	1

$\therefore 52 = 2 \times 2 \times 13$

$56 = 2 \times 2 \times 2 \times 7$

In these prime factorisation, 2 occurs maximum three times, 7 and 13 occurs maximum once

$\therefore$ LCM of 52 and 56 $= 2 \times 2 \times 2 \times 7 \times 13 = 728$ Ans.

(iii) 96, 360

2	360
2	180
2	90
3	45
3	15
5	5
	1

2	96
2	48
2	24
2	12
2	6
3	3
	1

$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$

$360 = 2 \times 2 \times 2 \times 3 \times 3 \times 5$

In these prime factorisation, 2 occurs maximum 5 times, 3 occurs maximum 2 times, 5 occurs maximum once

$\therefore$ LCM of 96 and 360 $= 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 1440$ Ans

Scanned with CamScanner

(iv) 36, 96, 180

2 | 36
2 | 18
3 | 9
3 | 3
| 1

2 | 96
2 | 48
2 | 24
2 | 12
2 | 6
3 | 3
| 1

2 | 180
2 | 90
3 | 45
3 | 15
5 | 5
| 1

$36 = 2 \times 2 \times 3 \times 3$

$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$

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

In these prime factorisation,
2 occurs maximum 5 times, 3 occurs maximum two times, 5 occurs maximum once

L.C.M. of 36, 96 and 180 $= 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 1440$ Ans.

(v) 18, 42, 72

2 | 18
3 | 9
3 | 3
| 1

2 | 42
3 | 21
7 | 7
| 1

2 | 72
2 | 36
2 | 18
3 | 9
3 | 3
| 1

$18 = 2 \times 3 \times 3$

$42 = 2 \times 3 \times 7$

$72 = 2 \times 2 \times 2 \times 3 \times 3$

In these prime factorisation,
2 occurs maximum three times, 3 occurs maximum two times, 7 occurs maximum once.

L.C.M. of 18, 42 and 72 $= 2 \times 2 \times 2 \times 3 \times 3 \times 7 = 504$ Ans.

2. Find LCM of the following by common division method.

(i) 24, 64

2 | 24, 64
2 | 12, 32
2 | 6, 16
2 | 3, 8
2 | 3, 4
| 3, 2

LCM of 24 and 64 $= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 = 192$ Ans.

Scanned with CamScanner

(ii) 42, 63

2	42, 63
3	21, 63
3	7, 21
	7, 7

LCM of 42 and 63 = 2 × 3 × 3 × 7 = 126

(iii) 108, 135, 162

2	108, 135, 162
2	54, 135, 81
3	27, 135, 81
3	9, 45, 27
3	3, 15, 9
	1, 5, 3

LCM of 108, 135 and 162 = 2 × 2 × 3 × 3 × 3 × 3 × 5 = 1620

(iv) 16, 18, 48

2	16, 18, 48
2	8, 9, 24
2	4, 9, 12
2	2, 9, 6
3	1, 9, 3
	1, 3, 1

L.C.M. of 16, 18 and 48 = 2 × 2 × 2 × 2 × 3 × 3 = 144 Ans.

(v) 48, 72, 108

2	48, 72, 108
2	24, 36, 54
2	12, 18, 27
2	6, 9, 27
3	3, 9, 27
3	1, 3, 9
	1, 1, 3

L.C.M. of 48, 72, 108
= 2 × 2 × 2 × 2 × 3 × 3 × 3
= 432 Ans.

Scanned with CamScanner

3. Find the smallest number which is divisible by 6, 8 and 10.

Solution :- We know that smallest number divisible by 6, 8 and 10 is their LCM.

So, we calculate LCM of 6, 8 and 10

2	6, 8, 10
3	3, 4, 5
4	1, 4, 5
5	1, 1, 5
	1, 1, 1

LCM of 6, 8 and 10 = 2 × 3 × 4 × 5 = 120 Ans.

4. Find the least number when divided by 10, 12 and 15 leaves remainder 7 in each case.

Solution. We know that least number divisible by 10, 15 and 12 is their LCM.

So the required number must be 7 more than their LCM.

We calculate LCM of 10, 12 and 15

2	10, 12, 15
2	5, 6, 15
3	5, 3, 15
	5, 1, 5

LCM of 10, 12 and 15 = 2 × 2 × 3 × 5 = 60

Hence Required number = 60 + 7 = 67 Ans.

5. Find the greatest 4-digit number divisible by 12, 18 and 30.

Solution :- First, find the LCM. of 12, 18 and 30

2	12, 18, 30
2	6, 9, 15
3	3, 9, 15
	1, 3, 5

∴ LCM = 2 × 2 × 3 × 3 × 5 = 180

Now, 4 digit greatest number is 9999.

Scanned with CamScanner

We find that when 9999 is divided by 180, the remainder is 99.

$$\begin{array}{r|l} 180 & 9999 \quad 55 \\ & 900 \\ \hline & 999 \\ & 900 \\ \hline & 99 \end{array}$$

∴ Greatest 4-digit number, which is exactly divisible by 12, 18 and 30 = 9999 − 99 = 9900 Ans.

6. Find the smallest 4-digit number exactly divisible by 15, 24 and 36.

Solution:- First Find the LCM of 15, 24, 36.

2	15, 24, 36
2	15, 12, 18
2	15, 6, 9
3	15, 3, 9
	5, 1, 3

∴ LCM = 8 × 2 × 2 × 3 × 3 × 5 = 360

Now, 4 digit smallest number is 1000.

We find that 1000 is divided by 360, the remainder is 280.

$$\begin{array}{r|l} 360 & 1000 \quad 2 \\ & 720 \\ \hline & 280 \end{array}$$

∴ Smallest 4-digit number, which is exactly divisible by 15, 24 and 36

= 1000 + (360 − 280)

= 1000 + 80 = 1080 Ans.

7. Four bells toll at intervals of 4, 7, 12 and 14 seconds. The bells toll together at 5am. When will they again toll together?

Scanned with CamScanner

Solution:- The bells will toll together at a time which is a multiple of four intervals 4, 7, 12 and 14 seconds
So, first we find LCM of 4, 7, 12 and 14.

2	4, 7, 12, 14
2	2, 7, 6, 7
	1, 7, 3, 7

$\therefore$ LCM = $2 \times 2 \times 3 \times 7 = 84$

Thus, the bells will toll together after 1 minute 24 seconds
First they toll together at 5am, then they will together after 1 minute 24 seconds i.e, 5:01:24 am

8. Three boys step off together from the same spot their measures 56cm, 70cm and 63cm respectively. At what distance from the starting point will they again step together?

Solution:- The distance covered by each one of them has to be same as well as minimum. So, the required distance each should walk would be LCM of the measure of their steps

2	56, 70, 63
2	28, 35, 63
2	14, 35, 63
3	7, 35, 63
3	7, 35, 21
5	7, 35, 7
	7, 7, 7

LCM = $2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 7$
= 2520
Hence required distance
= 2520cm Ans.

9. Can two numbers have 15 as HCF and 65 as their LCM. Give reasons in support of your answer.

Solution:- We know that HCF of given numbers is a factor of their LCM.
Here, 15 is not a factor of 65.
So, there cannot be two numbers with HCF 15 and LCM 65.

Scanned with CamScanner

10. Can two numbers have 12 as their HCF and 72 as their LCM. Give reasons in support of your answer.

Solution :-

We know that HCF of given numbers is a factor of their LCM.

Here, 12 is a factor of 72.

So, yes these can be two numbers with HCF 12 and LCM 72.

11. The HCF and LCM of two numbers 13 and 182 respectively. If one of the numbers is 26. Find other number.

Solution :- 1st Number × 2nd number = HCF × LCM

$$2^{nd} \text{ number} = \frac{HCF \times LCM}{1^{st} \text{ Number}}$$

$$= \frac{13 \times 182}{26} = 91$$

Hence other number is 91. Ans

12. The LCM of two co-prime numbers is 195. If one number is 15 then find the other number.

Solution :- We know that HCF of co-prime numbers is 1.

$$\therefore 1^{st} \text{ number} \times 2^{nd} \text{ number} = HCF \times LCM$$

$$2^{nd} \text{ Number} = \frac{HCF \times LCM}{1^{st} \text{ Number}} = \frac{1 \times 195}{15}$$

$$= 13$$

Hence other number is 13.

Scanned with CamScanner

13. The HCF of two numbers is 6 and product of two numbers is 216. Find their LCM.

Solution :-

product of two numbers = HCF × LCM

$$LCM = \frac{\text{product of two numbers}}{HCF}$$

$$= \frac{216}{6} = 36$$

Hence, LCM of two numbers = 36 Ans.

Scanned with CamScanner