EXERCISE 8(C) PAGE NO: 71

1. Using the common multiple method, find the L.C.M. of the following:
(i) 8, 12 and 24
(ii) 10, 15 and 20
(iii) 3, 6, 9 and 12
Solution:
(i) 8, 12 and 24

4	8	12	24
3	2	3	6
2	2	1	2
	1	1	1

We get,
L.C.M = 4 × 3 × 2
= 24
Hence, L.C.M. of 8, 12 and 24 = 24
(ii) 10, 15 and 20

2	10	15	20
2	5	15	10
3	5	15	5
5	5	5	5
	1	1	1

We get,
L.C.M = 2 × 2 × 3 × 5
= 60
Hence, L.C.M. of 10, 15 and 20 = 60
(iii) 3, 6, 9 and 12

2	3	6	9	12
2	3	3	9	6
3	3	3	9	3
3	1	1	3	1
	1	1	1	1

We get,
L.C.M. = 2 × 2 × 3 × 3
= 36
Hence, L.C.M. of 3, 6, 9 and 12 = 36

2. Find the L.C.M. of each of the following groups of numbers, using (i) the prime factor method and (ii) the common division method:
(i) 18, 24 and 96

(ii) 100, 150 and 200
(iii) 14, 21 and 98
(iv) 22, 121 and 33
(v) 34, 85 and 51
Solution:
(i) 18, 24 and 96
By using prime factor method, L.C.M. of 18, 24 and 96 are given below
Prime factors of 18 = 2 × 3 × 3
Prime factors of 24 = 2 × 2 × 2 × 3
Prime factors of 96 = 2 × 2 × 2 × 2 × 2 × 3
∴ L.C.M. = 2 × 2 × 2 × 2 × 2 × 3 × 3
= 288
By using common division method, L.C.M. of 18, 24 and 96 are given below

2	18	24	96
2	9	12	48
2	9	6	24
2	9	3	12
2	9	3	6
3	9	3	3
3	3	1	1
	1	1	1

∴ L.C.M. = 2 × 2 × 2 × 2 × 2 × 3 × 3
= 288
(ii) 100, 150 and 200
By using prime factor method, L.C.M. of 100, 150 and 200 are given below
Prime factor of 100 = 2 × 2 × 5 × 5
Prime factor of 150 = 2 × 3 × 5 × 5
Prime factor of 200 = 2 × 2 × 2 × 5 × 5
∴ L.C.M. = 2 × 2 × 2 × 3 × 5 × 5
= 600
By using common division method, L.C.M. of 100, 150 and 200 are given below

2	100	150	200
2	50	75	100
2	25	75	50
3	25	75	25
5	25	25	25
5	5	5	5
	1	1	1

∴L.C.M. = 2 × 2 × 2 × 3 × 5 × 5
= 600

(iii) 14, 21 and 98
By using prime factor method, L.C.M. of 14, 21 and 98 are given below
Prime factor of 14 = 2 × 7
Prime factor of 21 = 3 × 7
Prime factor of 98 = 2 × 7 × 7
∴ L.C.M. = 2 × 3 × 7 × 7
= 294
By using common division method, L.C.M. of 14, 21 and 98 are given below

2	14	21	98
3	7	21	49
7	7	7	49
7	1	1	7
	1	1	1

∴ L.C.M. = 2 × 3 × 7 × 7
= 294
(iv) 22, 121 and 33
By using prime factor method, L.C.M. of 22, 121 and 33 are given below
Prime factor of 22 = 2 × 11
Prime factor of 121 = 11 × 11
Prime factor of 33 = 3 × 11
∴ L.C.M. = 2 × 3 × 11 × 11
= 726
By using common division method, L.C.M. of 22, 121 and 33 are given below

2	22	121	33
3	11	121	33
11	11	121	11
11	1	11	1
	1	1	1

∴ L.C.M. = 2 × 3 × 11 × 11
= 726
(v) 34, 85 and 51
By using prime factor method, L.C.M. of 34, 85 and 51 are given below
Prime factor of 34 = 2 × 17
Prime factor of 85 = 5 × 17
Prime factor of 51 = 3 × 17
∴ L.C.M. = 2 × 3 × 5 × 17
= 510
By using common division method, L.C.M. of 34, 85 and 51 are given below

2	34	85	51
3	17	85	51
5	17	85	17
17	17	17	17
	1	1	1

∴ L.C.M. = 2 × 3 × 5 × 17
= 510

3. The H.C.F. and the L.C.M. of two numbers are 50 and 300 respectively. If one of the numbers is 150, find the other one.
Solution:
Given
H.C.F. = 50
L.C.M. = 300
One number = 150
We know that,
Product of H.C.F. and L.C.M. of two numbers is equal to product of those two numbers
For other number,
50 × 300 = 150 × other number
15000 / 150 = other number
100 = other number
Hence, the other number is 100

4. The product of two numbers is 432 and their L.C.M. is 72. Find their H.C.F.
Solution:
Given
Product of two numbers = 432 and L.C.M.= 72
We know that,
Product of H.C.F. and L.C.M. of two numbers is equal to product of those two numbers.
Now, to find H.C.F
H.C.F. × 72 = 432
H.C.F.= 432 / 72
H.C.F. = 6
Hence, H.C.F. = 6

5. The product of two numbers is 19,200 and their H.C.F. is 40. Find their L.C.M.
Solution:
Given
Product of two numbers = 19200 and H.C.F. = 40
We know that,

Product of H.C.F. and L.C.M. of two numbers is equal to product of those two numbers
Now, to find L.C.M.
40 × L.C.M. = 19200
L.C.M. = 19200 / 40
L.C.M. = 480
Hence, L.C.M. = 480

6. Find the smallest number which, when divided by 12, 15, 18, 24 and 36 leaves no remainder.
Solution:
The given numbers L.C.M. will be the least number which is exactly divisible 12, 15, 18, 24 and 36 and leaves no remainder

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

L.C.M. = 2 × 2 × 2 × 3 × 3 × 5
= 360
Hence, smallest required number = 360

7. Findthe smallest number which, when increased by one is exactly divisible by 12, 18, 24, 32 and 40.
Solution:
First, let us find out the L.C.M. of 12, 18, 24, 32 and 40

2	12	18	24	32	40
2	6	9	12	16	20
2	3	9	6	8	10
2	3	9	3	4	5
2	3	9	3	2	5
3	3	9	3	1	5
3	1	3	1	1	5
5	1	1	1	1	5
	1	1	1	1	1

L.C.M. = 2 × 2 × 2 × 2 × 2 × 3 × 3 × 5
= 1440
This can be written as
= 1439 + 1

Hence, 1439 is the smallest number which, when increased by one is exactly divisible by the given numbers

8. Find the smallest number which, on being decreased by 3, is completely divisible by 18, 36, 32 and 27.

Solution:

First, let us solve for L.C.M. of 18, 36, 32 and 27

2	18	36	32	27
2	9	18	16	27
2	9	9	8	27
2	9	9	4	27
2	9	9	2	27
3	9	9	1	27
3	3	3	1	9
3	1	1	1	3
	1	1	1	1

L.C.M. = 2 × 2 × 2 × 2 × 2 × 3 × 3 × 3

= 864

This can be written as

= 867 – 3

Hence, 867 is the smallest number which, when decreased by 3 is exactly divisible by the given numbers