(iii) Common division method:

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

LCM = 2 × 2 × 3 × 3 × 2
= 72.

H.W
23.6.21

Exercise - 8C

1. Using the common multiple method, find the LCM of the following:-

i) 8, 12 and 24

8 = 8, 16, (24), 32.....
12 = 12, (24), 36.....
24 = (24), 48.....

LCM = 24

ii) 10, 15 and 20

10 = 10, 20, 30, 40, 50, (60)....
15 = 15, 30, 45, (60).....
20 = 20, 40, (60).....

LCM = 60

iii) 3, 6, 9 and 12.

3 | 3, 6, 9, 12	3 = 3, 6, 9, 12, 15, 18, 21, 24, 27,
2 | 1, 2, 3, 4	30, 33, (36), 39.....
2 | 1, 1, 3, 2	6 = 6, 12, 18, 24, 30, (36), 42.....
3 | 1, 1, 3, 1	9 = 9, 18, 27, (36), 45.....
1, 1, 1, 1	12 = 12, 24, (36), 48.....

LCM = 3 × 2 × 2 × 3 = 36

LCM = 36.

2. Find the LCM 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

→ the prime factor method:

$18 = 2 \times 3 \times 3$
$= 2^1 \times 3^2$

$24 = 2 \times 2 \times 2 \times 3$
$= 2^3 \times 3^1$

$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$
$= 2^5 \times 3^1$

$LCM = 2^5 \times 3^2$
$= 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$
$= 288$

→ common division method:

2	18, 24, 96
3	9, 12, 48
2	3, 4, 16
2	3, 2, 8
2	3, 1, 4
	3, 1, 2

LCM = 2 × 3 × 2 × 2 × 2 × 3 × 2
= 288

ii) 100, 150 and 200

→ Prime factor method.

2	100, 150, 200
5	50, 75, 100
5	10, 15, 20
2	2, 3, 4
	1, 3, 2

100 = 2 × 2 × 5 × 5
= $2^2 \times 5^2$

150 = 2 × 3 × 5 × 5
= $2^1 \times 3^1 \times 5^2$

200 = 2 × 2 × 2 × 5 × 5
= $2^3 \times 5^2$

LCM = $2^3 \times 3^1 \times 5^2$
= 2 × 2 × 2 × 3 × 5 × 5
= 600

→ common division method:

2	100, 150, 200
5	50, 75, 100
5	10, 15, 20
2	2, 3, 4
	1, 3, 2

LCM = 2 × 5 × 5 × 2 × 3 × 2
= 600

iii) 14, 21 and 98.

→ Prime factors method.

$14 = 2 \times 7$
$= 2^1 \times 7^1$

$21 = 3 \times 7$
$= 3^1 \times 7^1$

$98 = 2 \times 7 \times 7$
$= 2^1 \times 7^2$

$LCM = 2^1 \times 3^1 \times 7^2$
$= 2 \times 3 \times 7 \times 7$
$= 294.$

→ Common division method.

7	14, 21, 98
2	2, 3, 14
	1, 3, 7

$LCM = 7 \times 2 \times 3 \times 7$
$= 294$

iv) 22, 121 and 33

→ Prime factors method.

$22 = 2 \times 11$
$= 2^1 \times 11^1$

$121 = 11 \times 11$
$= 11^2$

$33 = 3 \times 11$
$= 3^1 \times 11^1$

$LCM = 2^1 \times 3^1 \times 11^2$
$= 2 \times 3 \times 11 \times 11 = 726$

→ Common division method

11	121, 22, 33
	11, 2, 3

$LCM = 11 \times 2 \times 3 \times 11$
$= 726.$

v) 34, 85 and 51

→ prime factor method.

$34 = 2 \times 17$
$= 2^1 \times 17^1$

$85 = 5 \times 17$
$= 5^1 \times 17^1$

$51 = 3 \times 17$
$= 3^1 \times 17^1$

$LCM = 2^1 \times 3^1 \times 5^1 \times 17^1$
$= 2 \times 3 \times 5 \times 17$
$= 510$

→ common division method

17	34, 85, 51
	2, 5, 3

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

How
24.6.21

(3) The H.C.F and L.C.M of two nos are 50 and 300 respectively. If one of the no. is 150, find the other one.

Note: HCF × LCM = the product of the two numbers

Ans → H.C.F = 50
L.C.M = 300

first number = 150

H.C.F × L.C.M = First no. × Second no.
⇒ 50 × 300 = 150 × Second no.
⇒ 15000 = 150 × Second no.
$= \frac{15000}{150}$ = second no.

$\Rightarrow \frac{15000}{150} = 100$

So, the other no. is 100.

(4) The product of two no.s is 432 and their L.C.M is 72. Find their H.C.F.

Ans- The product of two no.s = 432
The LCM of two no.s = 72

Product of two no.s = HCF x LCM
$\Rightarrow 432 = HCF \times 72$
$\Rightarrow \frac{432}{72} = HCF$

$\Rightarrow \frac{432}{72} = 6$

So, the HCF of the two no.s is 6.

(5) The product of two no.s is 19,200 and their H.C.F is 40. Find their L.C.M.

Ans- The product of two numbers = 19,200
HCF = 40

Product of two no.s = HCF x LCM
$\Rightarrow 19,200 = 40 \times LCM$
$\Rightarrow \frac{19,200}{40} = LCM$

$= \frac{19,200}{40} = 480$

So, the LCM of the two no.s is 480.

(6) Find the smallest no. which, when divided by 12, 15, 18, 24 and 36 leaves no remainder.

Ans- LCM of the given no.s will be the least no. which is exactly divisible by 12, 15, 18, 24 and 36 and ~~leaves~~ leaves no remainder.

2	12, 15, 18, 24, 36
3	6, 15, 9, 12, 18
2	2, 5, 3, 4, 6
3	1, 5, 3, 2, 3
	1, 5, 1, 2, 1

LCM = 2 x 3 x 2 x 3 x 5 x 2
= 360

Hence, the smallest no. required is 360.

(7) Find the smallest no. which, when increased by one is exactly divisible by 12, 18, 24, 32 and 40.

Ans- LCM 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
3	3, 9, 3, 2, 5
	1, 3, 1, 2, 5

LCM = 2x2x2 x2x3x3x 2x5
= 1440

1440 ~~can~~ be is the smallest no. which can be divided by the given no.s exactly.

The required no. = 1440 - 1
= 1439

Hence, 1439 is the smallest no. which, when increased by one is exactly divisible by the given numbers.

(8) Find the smallest no. which, on being decreased by three, is completely divisible by 18, 36, 32, and 27.

Sol- hCM of 18, 36, 32, 27 is the smallest no. which is exactly divisible by the given nos.

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

hCM = 2 x 2 x 2 x 2 x 3 x 3 x 2 x 3
= 864

The required no. = 864 + 3
= 867

Hence, 867 is the smallest no. which when decreased by 3 is exactly divisible by the given nos.