Multiple

least common multiple of 5 and 7:

Multiple of 5: - 5; 10; 15; 20, 25; 30; 35 ....
multiple of 7 7; ; 14; 21, 28; 35, ...
The least common multiple of 5 and 7 is 35
LCM (5, 7) = 35

Program to find LCM of two numbers.

LCM = Smallest Number that divides both.

15 = 5 x 3
25 = 5 x 5
Union of all factors = 5 x 5 x 3 = 75.

Methods of finding LCM.

i) common multiple method;

ii) Prime factor method

iii) Common division method.
LCM of 18, 24 and 36

1) Common multiple Method

M18 = 18, 36, 54, (72), 90 - - - - -
M24 = 24, 48, (72), 96, 120 - - - -
M36 = 36, (72) - - - -

LCM = 72

$15 = 5 \times 3 = 5^1 \times 3$

$25 = 5 \times 5 = 5^2$

lcm of 15 and 25

$= 5^2 \times 3$

$= 5 \times 5 \times 3$

$= 75$

16 and 24

$16 = 2 \times 2 \times 2 \times 2 = 2^4$

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

lcm $2^4 \times 3 = 2 \times 2 \times 2 \times 2 \times 3 = 48$

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

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

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

LCM of 18, 24 and 36

$= 2^3 \times 3^2 = 2 \times 2 \times 2 \times 3 \times 3$

$= 72$

Common division method

LCM of 18, 24, 36

LCM

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

1 1 1

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

HCF×LCM of two numbers.
= Product of the Numbers.

18, 24

HCF = 18) 24 (1
18
6) 18 (3
18
0

HCF of 18 and 24 = 6.

example

LCM = 2 | 18 24
3 | 9 12
2 | 3 4
3, 2

LCM = 2×3×2×3×2 = 72

6×72 = 432.

Evaluation Questions.

By using common division method, LCM of 18, 24 and 96 are given below.

∴ L.C.M = 2×2×2×2×2×3×3
= 288.

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

2. Find the Lcm of each of the following groups of numbers, using i) the prime factor method:

i) 18, 24 and 96

By using prime factor method, Lcm of 18, 24 and 96 are given below ~~prime factor~~

Prime factors of $18 = 2 \times 3 \times 3$
Prime factors of $24 = 2 \times 2 \times 2 \times 3$
Prime factors of $96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$
$L.C.M = 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 288$

By using common division method, LCM of 18, 24 and 96 are given below

$\therefore$ LCM $= 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 288$

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

3. The HCF and the LCM of two numbers are 50 and 300 respectively. If one of the numbers is 150, find the other one.

Ans HCF = 50 LCM = 300
One number = 150.
We know that, Product of HCF and LCM of two numbers is equal to product of those two number

50 x 300 = 150 x 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 LCM is 72. Find their HCF.

Ans. Product of two numbers = 432 and LCM = 72
We know that,
Product of HCF and LCM of two numbers is equal to product of those two ~~product~~ numbers

Now, to find H.C.F
H.C.F x 72 = 432
H.CF x 72 = 432
H.CF = 432/72
HCF = 6
Hence, HCF = 6.

Evaluation Question

5. The product of two numbers is 19,200 and their H.C.F is 40. Find their L.C.M.

Ans Given:
product of two numbers = 19200 and HCF = 40
We know that,
Product of HCF and LCM of two numbers is equal to product of those two numbers.
Now, to find LCM.
$40 \times LCM = 19200$
$LCM = 19200/40$

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

Ans- The given numbers L.C.M will be the last number which is exactly divisible 12, 15, 18, 24, 36 and leaves no remainder.

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

	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

Hence, Smallest required number = 360

7. Find the smallest number which, when increased by one is exactly divisible by 12, 18, 24, 32, 40.

Ans: Firstly, 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

LCM = 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 ~~decred~~ decreased by 3, is completely divisible by 18, 36, 32, 9 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

First, let us solve for

LCM = 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