Tender Heart High School ; Sec- 33 B , Chandigarh

Class :- VI
Subject:- Mathematics

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Ch-6. Playing with Numbers.

Least Common Multiple (L.C.M.)

The L.C.M. of two or more natural numbers is the smallest of the Common Multiples of the given numbers.

Methods for finding the L.C.M. of given numbers.

1. Prime Factorisation Method
2. Common division Method.

Relation Between H.C.F. and L.C.M. of two given numbers.

Product of two numbers = Product of their H.C.F and L.C.M.

1st number × 2nd number = (H.C.F × L.C.M)

$$L.C.M. = \frac{1^{st} \text{ number} \times 2^{nd} \text{ number}}{H.C.F}$$

$$H.C.F = \frac{1^{st} \text{ number} \times 2^{nd} \text{ number}}{L.C.M.}$$

Q.1. Find the L.C.M. of the following numbers using prime factorisation method:

(i) 18, 24

Soln:- By prime factorisation, we have:-

2 | 18
3 | 9
3 | 3
| 1

2 | 24
2 | 12
2 | 6
3 | 3
| 1

$18 = 2 \times 3 \times 3$

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

$LCM(18, 24) = 2 \times 3 \times 3 \times 2 \times 2$

$= 72$

LCM of 18 and 24 = 72

(ii) 36, 54, 81

Soln:- By prime factorisation, we have:-

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

2 | 54
3 | 27
3 | 9
3 | 3
| 1

3 | 81
3 | 27
3 | 9
3 | 3
| 1

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

$54 = 2 \times 3 \times 3 \times 3$

$81 = 3 \times 3 \times 3 \times 3$

LCM (36, 54, 81) = 2 × 3 × 3 × 3 × 2 × 3
= 324

Q2. Find the L.C.M. of the following, using common division method.

(i) 8, 10, 12, 16.

By common division method, we get

2	8 - 10 - 12 - 16
2	4 - 5 - 6 - 8
2	2 - 5 - 3 - 4
2	1 - 5 - 3 - 2
3	1 - 5 - 3 - 1
5	1 - 5 - 1 - 1
	1 - 1 - 1 - 1

∴ LCM (8, 10, 12, 16) = 2 × 2 × 2 × 2 × 3 × 5
= 240

(ii) 16, 18, 24, 32, 36.

2	16 - 18 - 24 - 32 - 36
2	8 - 9 - 12 - 16 - 18
2	4 - 9 - 6 - 8 - 9
2	2 - 9 - 3 - 4 - 9
2	1 - 9 - 3 - 2 - 9
3	1 - 9 - 3 - 1 - 9
3	1 - 3 - 1 - 1 - 3
	1 - 1 - 1 - 1 - 1

∴ L.C.M (16, 18, 24, 32, 36) = 2 × 2 × 2 × 2 × 2 × 3 × 3
= 288

Q3 The H.C.F. of two numbers is 23 and their L.C.M. is 276. If one of the numbers is 92, find the other.

Soln:- The H.C.F of two numbers = 23
The L.CM " " " = 276
One number = 92

$$\therefore \text{The other number} = \frac{(\text{H.C.F.}) \times (\text{L.CM})}{\text{given no.}}$$

$$= \frac{23 \times 276}{92}^{3}$$

$$= 23 \times 3 = 69$$

Hence, the other number is 69.

Q4. The product of two numbers is 2925 and their H.C.F is 15. Find their L.C.M.

Soln:- We know that:-

$$\text{L.CM} = \frac{\text{Product of given numbers}}{\text{their H.C.F.}}$$

$$= \frac{2925}{15}$$

$$= 195$$

Hence, the L.CM of given no's is 195

Q5. Can there be two numbers having H.C.F. 12 and L.C.M. 64? Give answer in support of your answer.

Soln:- We know that:-

H.C.F of two numbers divides their L.C.M. exactly.

$\therefore$ $64 \div 12$

$$\begin{array}{r} 5 \\ 12\overline{)\,64} \\ -60 \\ \hline 4 \end{array}$$

Here, 64 is not divisible by 12 completely.

So, there cannot be two no's having HCF 12 and LCM 64.

Q6. Find the smallest number which when divided by 15, 20, 25 and 30 leaves 5 as remainder in each case.

Soln:- Required number = LCM(15, 20, 25, 30) + 5

2	15, 20, 25, 30
2	15, 10, 25, 15
3	15, 5, 25, 15
5	5, 5, 25, 5
5	1, 1, 5, 1
	1, 1, 1, 1

$\therefore$ LCM $= 2 \times 2 \times 3 \times 5 \times 5 = 300$

Hence, the required no $= (300 + 5) = 305$.

Q10. Six bells commence tolling together and toll at intervals of 2, 4, 6, 8, 10 and 12 minutes respectively. After what interval of time will they toll together again?

Soln:- Given, – Six bells commence tolling together and toll at intervals of 2, 4, 6, 8, 10, 12 min respectively.

Required time period for six bells to toll together = LCM (2, 4, 6, 8, 10, 12)

2	2, 4, 6, 8, 10, 12
2	1, 2, 3, 4, 5, 6
2	1, 1, 3, 2, 5, 3
3	1, 1, 3, 1, 5, 3
5	1, 1, 1, 1, 5, 1
	1, 1, 1, 1, 1, 1

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

$= 120$

So, after each 120 min (2 hrs), they would toll together.

Q11. An electronic device ---------- beep together?

Soln:- Here, we have to find the L.C.M (15, 20).

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

ie. LCM (15, 20) = $2 \times 2 \times 3 \times 5$

= 60 minutes.

= 1 hr.

which means after 1 hr (60 min) the device beep together.

So, at 11 a.m. device beep together.