

Ex-8(c)

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

i) 8, 12 and 24

$$2 \mid 8, 12, 24$$

$$2 \mid 4, 6, 12$$

$$2 \mid 2, 3, 6$$

$$3 \mid 1, 3, 3$$

$$3 \mid 1, 1, 1$$

$$\text{LCM} = 2 \times 2 \times 2 \times 3 = 24$$

ii) 10, 15, and 20

$$2 \mid 10, 15, 20$$

$$2 \mid 5, 15, 10$$

$$3 \mid 5, 15, 5$$

$$5 \mid 5, 5, 5$$

$$1, 1, 1$$

$$\text{LCM} = 2 \times 2 \times 3 \times 5 = 60$$

iii) 3, 6, 9 and 12

$$3 \mid 3, 6, 9, 12$$

$$3 \mid 1, 2, 3, 4$$

$$2 \mid 1, 2, 1, 4$$

$$2 \mid 1, 1, 1, 2$$

$$1, 1, 1, 1$$

$$\text{LCM} = 3 \times 3 \times 2 \times 2 = 36$$

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

By using prime factor method:

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

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

$$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 1$$~~

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

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

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

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

$$\begin{aligned} \text{LCM} &= 2^5 \times 3^2 \\ &= 288 \end{aligned}$$

By using common division method:

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

$$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 288$$

(ii) 100, 150 and 200

By using prime factor method

2	100
2	50
5	25
	5

$$100 = 2 \times 2 \times 5 \times 5$$

$$150 = 2 \times 3 \times 5 \times 5$$

$$200 = 2 \times 2 \times 2 \times 5 \times 5$$

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

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

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

$2 \overline{)150}$	$2 \overline{)200}$
$3 \overline{)75}$	$2 \overline{)100}$
$5 \overline{)25}$	$2 \overline{)50}$
5	$5 \overline{)25}$
	5

$$\text{LCM} = 2^3 \times 3^1 \times 5^2 = 600$$

By using division method :

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

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 5 \times 5 = 600$$

(iii) 14, 21, 98

By using Prime factor method :

$14 = 2 \times 7$	$2 \overline{)14}$	$3 \overline{)21}$	$2 \overline{)98}$
$21 = 3 \times 7$	7	7	$7 \overline{)49}$
$98 = 2 \times 7 \times 7$			7

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

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

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

$$\text{LCM} = 2^1 \times 3^1 \times 7^2$$

$$= 294$$

By using division method :

$$\begin{array}{r}
 2 \mid 14, 21, 98 \\
 3 \mid 7, 21, 49 \\
 7 \mid 7, 7, 49 \\
 7 \mid 1, 1, 7 \\
 \hline
 1, 1, 1
 \end{array}$$

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

(iv) 22, 121, 33

By using Prime factor method :

$$\begin{array}{r}
 2 \mid 22 \quad 11 \mid 121 \quad 3 \mid 33 \\
 \hline
 11 \quad \quad \quad 11 \quad \quad \quad 11
 \end{array}$$

~~22 = 2 \times 11~~ or $2^1 \times 11^1$
 $121 = 11 \times 11$ or 11^2 ~~or~~
 $33 = 3 \times 11$ or $3^1 \times 11^1$

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

By using common division method :

$$\begin{array}{r}
 2 \mid 22, 121, 33 \\
 3 \mid 11, 121, 33 \\
 11 \mid 11, 121, 11 \\
 11 \mid 1, 11, 1 \\
 \hline
 1, 1, 1
 \end{array}$$

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

(v) 34, 85, 51

By using Prime factor method :

$$\begin{array}{r|l} 2 & 34 \\ \hline & 17 \end{array} \quad \begin{array}{r|l} 5 & 85 \\ \hline & 17 \end{array} \quad \begin{array}{r|l} 3 & 51 \\ \hline & 17 \end{array}$$

$$34 = 2 \times 17$$

$$85 = 5 \times 17$$

$$51 = 3 \times 17$$

$$\text{LCM} = 2 \times 3 \times 5 \times 17 = 510$$

By using Common division method :

$$\begin{array}{r|l} 2 & 34, 85, 51 \\ \hline 3 & 17, 85, 51 \\ \hline 5 & 17, 85, 17 \\ \hline 17 & 17, 17, 17 \\ \hline & 1, 1, 1 \end{array}$$

$$\text{LCM} = 2 \times 3 \times 5 \times 17 = 510$$

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

$$\text{HCF} = 50$$

$$\text{LCM} = 300$$

$$\text{one number} = 150$$

$$\text{other number} = ?$$

$$\text{other number} = \frac{\text{HCF} \times \text{LCM}}{\text{the no. given}}$$

$$= \frac{50 \times 300}{\cancel{750}^3} = 100$$

Therefore the other number is 100.

4. The product of two numbers is 432 and their LCM is 72. Find their HCF.

Product of two numbers = 432

LCM = 72

HCF = ?

$$\text{HCF} = \frac{432}{\cancel{72}^{216} \times \cancel{36}^{54}} = 6$$

Therefore the HCF = 6.

5. The product of two numbers is 19,200 and their HCF is 40. Find their LCM.

Product of two numbers = 19,200

HCF = 40

LCM = ?

$$\text{LCM} = \frac{19200}{\cancel{40}^{960} \times \cancel{2}^{480}} = 480$$

Therefore the LCM is 480.

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

$$\begin{array}{r|l}
 2 & 12, 15, 18, 24, 36 \\
 2 & 6, 15, 9, 12, 18 \\
 2 & 3, 15, 9, 6, 9 \\
 3 & 3, 15, 9, 3, 9 \\
 3 & 1, 5, 3, 1, 3 \\
 5 & 1, 5, 1, 1, 1 \\
 & 1, 1, 1, 1, 1
 \end{array}$$

$$\begin{aligned}
 \text{LCM} &= 2 \times 2 \times 2 \times 3 \times 3 \times 5 \\
 &= 360
 \end{aligned}$$

So the smallest number is 360.

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

$$\begin{array}{r|l}
 2 & 12, 18, 24, 32, 40 \\
 2 & 6, 9, 12, 16, 20 \\
 2 & 3, 9, 6, 8, 10 \\
 2 & 3, 9, 3, 4, 5 \\
 2 & 3, 9, 3, 2, 5 \\
 3 & 3, 9, 3, 1, 5 \\
 3 & 1, 3, 1, 1, 5 \\
 5 & 1, 1, 1, 1, 5 \\
 & 1, 1, 1, 1, 1
 \end{array}$$

$$\begin{aligned}
 \text{LCM} &= 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \\
 &= 1440
 \end{aligned}$$

Increased by 1 can ~~be~~ be written as $1439 + 1$.

So the Smallest number is 1439.

8. Find the Smallest number which, on being decreased by 3, is completely divisible by 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

$$\text{LCM} = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$$

$$= 864$$

decreased by 3 can be written as $864 - 3$
 so the smallest number is 867.

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