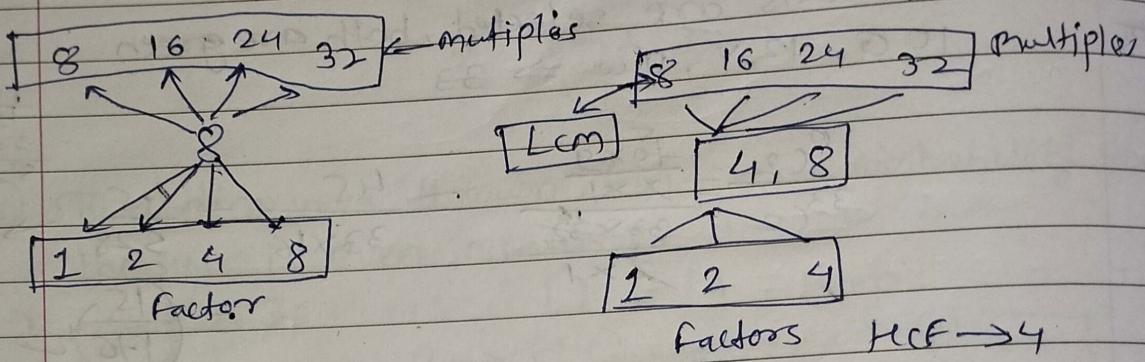


29/11/2025

18. LCM and HCF

DATE : / /

HCF - Highest common factor
LCM - Lowest common multiple



उत्तर अंक 2) common divisor HCF-1 and LCM रेटिंग
multiplication. these no. is co-prime number

$$\begin{array}{c}
 \text{HCF} \quad \text{LCM} \\
 \begin{array}{ccc}
 1 & \xleftarrow{\quad} & (3, 5) & \xrightarrow{\quad} & 15 \\
 1 & \xleftarrow{\quad} & (2, 5, 3) & \xrightarrow{\quad} & 30
 \end{array} \\
 \text{co-prime}
 \end{array}$$

$$\begin{array}{ccccccc}
 & 4 & \leftarrow & 4, & \boxed{8} & \rightarrow & 8 \\
 & 4 & \leftarrow & 4, & \boxed{16} & \rightarrow & 16 \\
 & 4 & \leftarrow & 4, & \boxed{12} & \rightarrow & \boxed{24} \\
 & 4 & \leftarrow & 12, & \boxed{6} & \rightarrow & \boxed{48} \\
 & & & & \begin{array}{c} 32 \\ \hline 48 \end{array} & &
 \end{array}$$

#	HCF	(Co-Prime)	LCM
1	a : b	(ab)	

The diagram illustrates the relationship between HCF and LCM. On the left, there is a circle with a number sign (#). To its right, the text "HCF" is written above the symbol "x". In the center, there is a box containing "a:b". To the right of the box, the text "Divisible" is written below a curved arrow pointing towards the box. Above the box, the text "(ax & bx)" is written. To the right of the box, the text "LCM" is written above the symbol "x". Below the box, the text "(abx)" is written.

HCF \rightarrow GCD

- 1) Find the [greatest] number that will divide 43, 91 and 183 so as to leave the same remainder in each case.

$$\Rightarrow \begin{array}{ccc} & 140 & \\ 43 & \xrightarrow{\text{diff}} & 91 \xrightarrow{\text{diff}} 183 \\ 48 & \xrightarrow{\text{diff}} & 92 \end{array}$$

$$\text{HCF} \rightarrow 48 \quad 92 \quad 140$$

~~$140, 8, 18, 24$~~

- 2) The HCF of two numbers is 23 and the other two factors of their L.C.M are 13 and 14. The larger of the two numbers is:

$$\Rightarrow \begin{array}{cccc} \text{HCF} & A & B & \text{Lcm} \\ 23 & 13 : 14 & & 13 \times 14 \\ \text{HCF} & \text{ab}x & \text{two factors so, ratio of numbers is} & 13 \times 14 \\ x & & & 13 \times 14 = 322 \end{array}$$

- 3) six bells commence tolling together and toll at intervals of 2, 4, 6, 8, 10 and 12 seconds respectively. In 30 minutes, how many times do they toll together?

$$\Rightarrow \begin{array}{cc} 2, 4, 6, 8, 10, 12 & \text{Lcm} \\ 12, 8, 10 & 120 \text{ sec} = 2 \text{ min} \\ \frac{30}{2} = 15 & \\ \text{Starting time} & 1 + 15 = 16 \text{ times} \end{array}$$

- 4) Let N be the greatest number that will divide 1305, 4665, and 6905, leaving the same remainder in each case. Then sum of the digits in N is:

$$\begin{array}{ccccccc}
 & & & 5600 & & & \\
 & & \swarrow \text{Diff} & & \searrow \text{Diff} & & \\
 1305 & & 4665 & & 6905 & & \\
 \swarrow \text{Diff} & & \uparrow \text{Diff} & & \uparrow \text{Diff} & & \\
 3360 & & 2240 & & & & \\
 & & & & \leftarrow \text{HCF} & & \\
 \text{HCF} \rightarrow 3360, 2240, 5600 \Rightarrow 1120 & & & & & & \\
 & & & & (1+1+2+0) = 4 & &
 \end{array}$$

$$\begin{array}{r}
 3360 \overline{) 5600} \quad \text{HCF} \\
 \underline{-3360} \\
 \hphantom{3360) } 2240 \overline{) 3360} \quad \text{HCF} \\
 \underline{-2240} \\
 \hphantom{2240) } 1120 \overline{) 2240} \quad \text{HCF} \\
 \underline{-2240} \\
 \hphantom{2240) } 0
 \end{array}$$

- 5) The greatest number of four digits which is divisible by 15, 25, 40 and 75 is:

$$\begin{array}{l}
 \rightarrow 15, 25, 40, \boxed{75} \Rightarrow \text{LCM} \\
 \text{LCM} = 150 \quad \boxed{600} \\
 \quad \quad \quad 300 \\
 \quad \quad \quad 600 \\
 600 \overline{) 9999} \quad \text{LCM} \\
 \underline{-600} \\
 \hphantom{600) } 3999 \\
 \quad \quad \quad 3600 \\
 \underline{-3600} \\
 \hphantom{3600) } 399 \\
 \quad \quad \quad 399 \\
 \underline{-399} \\
 \hphantom{399) } 9600 \quad \boxed{4}
 \end{array}$$

- 6) The product of two numbers is 4107. If the HCF of these numbers is 37, then the greater number is:

$$\boxed{A \times B = \text{LCM} \times \text{HCF}}$$

$$4107 = 37 \times \text{LCM} = 37 \times 111$$

$$\text{LCM} = \frac{4107}{37} = 111 \quad \frac{111}{37} = 3$$

$$\begin{array}{c} \text{HCF} \\ x \\ \xrightarrow{\quad} \end{array} \quad \begin{array}{c} \text{LCM} \\ (ab)x \\ 3 \\ 1 \times 3 \end{array}$$

$$\begin{array}{c} 1 : 3 \\ x_{37} \quad x_{37} \\ \xrightarrow{\quad 111 \quad} \text{greater number.} \end{array}$$

7) Three numbers are in the ratio of 3:4:5 and their L.C.M is 2400. Their H.C.F is:

$$\Rightarrow \begin{array}{c} \text{HCF} \quad a:b:c \quad (\text{LCM}) \\ x \quad 3:4:5 \quad x \times 3 \times 4 \times 5 = 2400 \\ \xrightarrow{\quad 40 \quad} \quad x=40 \end{array}$$

8) The G.C.D of 1.08, 0.36 and 0.9 is
 $\Rightarrow 1.08, 0.36, 0.9 \Rightarrow 0.18$ Ans

$$\text{HCF} \rightarrow 108, 36, 900 \Rightarrow 18$$

9) The product of two numbers is 2028 and their H.C.F is 13. The number of such pairs is:

$$\text{LCM} = \frac{2028}{13} = 156$$

$$\begin{array}{c} \text{HCF} \quad \text{LCM} \\ x \quad abx \\ \xrightarrow{\quad} \end{array} \quad \begin{array}{c} \frac{156}{13} = 12 \Rightarrow ab \\ (1,12) \\ (2,6) \\ (3,4) \end{array} \quad \begin{array}{c} (3) \\ \checkmark \end{array} \text{Pair}$$

10) The least multiple of 7, which leaves a remainder of 4, when divided by 6, 9, 15 and 18 is:

$$\Rightarrow 6, 9, 15, 18 \Rightarrow 90 + 4 = 94 \times$$

$$180 + 4 = 184 \times$$

$$360 + 4 = \boxed{364} \checkmark$$

divide by
7 and
leaves
remainder
4

11) Find the lowest common multiple of 24, 36 and 40.

$$\Rightarrow 24, 36, \boxed{140}$$

$$80 \times$$

$$120 \times$$

$$\boxed{360} \checkmark \text{ Lcm}$$

	24	36	40
4	6	9	10
3	2	3	10
2	1	3	5
15			

$$15 \times 2 \times 3 \times 4 = \boxed{360} \checkmark$$

12) The least number which should be added to 2497 so that the sum is exactly divisible by 5, 6, 4 and 3 is:

$$\Rightarrow 5, 6, 4, 3 \rightarrow \boxed{60} \text{ Lcm}$$

$$60) 2497 (41 \\ 240 \\ \hline 97 \\ 60 \\ \hline 37 \\ \hline$$

$$2497 = 2460 + \boxed{37 + 23} \rightarrow \begin{matrix} \boxed{60} \\ \text{ans} \end{matrix} \boxed{23} \text{ is added}$$

13) Reduce $\frac{128352}{238368}$ to its lowest terms.

$$\begin{array}{r} 7 \\ \overline{)128352} \\ -238368 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 7 \\ \overline{)13} \end{array}$$

14) The least number which when divided by 5, 6, 7 and 8 leaves a remainder 3, but when divided by 9 leaves no remainder is:

$$g \rightarrow (9) 8, 1, 2, 3$$

By option

1) 1677	2) 1683	3) 2523	4) 3363
\times	$\cancel{\times}$	\times	\times
divide by 9			

14) $5, 6, 7, 8 \xrightarrow{\text{LCM}} 840 + 3 = 843 \cancel{2}$
 $1680 + 3 = \boxed{1683} \checkmark$

15) A, B and C start at the same time in the same direction to run around a circular stadium. A completes a round in 252 seconds, B in 308 seconds and C in 198 seconds, all starting at the same point. After what time will they again at the starting Point?

\Rightarrow

$\cancel{\times} 2$	252	308	198
$\cancel{\times} 3$	126	154	99
$\cancel{\times} 3$	42	154	33
$\cancel{\times} 2$	14	154	11
$\cancel{\times} 7$	7	11	11
$\cancel{\times} 11$	1	11	11

$$1\text{ CM} = 2.772 \text{ sec.}$$

$$2400 + 300 + 60 + 12 = 40\text{ min} + 5\text{ min} + 1\text{ min} + 12\text{ sec.} \\ = \boxed{46 \text{ min } 12 \text{ sec.}} \checkmark$$

16) The HCF of two numbers is 11 and their L.C.M. is 7700 if one of the numbers is 275. Then the other is:

$$\Rightarrow A \times B = \text{Lcm} \times \text{Hcf}$$

$$B = \frac{11 \times 7700}{275} = 308$$

17) What will be the least number which when doubled will be exactly divisible by 12, 18, 21 and 30?

$$\Rightarrow [N] \Rightarrow [630] \checkmark \text{ Ans}$$

$$\begin{array}{r} \downarrow \times 2 \\ [\text{LCM}] \\ 1260 \end{array} \rightarrow 6 \times 2 \times 3 \times 35$$

6	12	18	21	30
2	2	3	21	5
3	1	3	21	5
35	1	1	7	5

18) The ratio of two numbers is 3:4 and their HCF is 4. Their Lcm is

$$\begin{array}{l} \text{HCF} \quad A : B \quad \text{Lcm} \\ 4 \quad 3 : 4 \quad ab \times c \\ 4 \times 12 = 48 \end{array}$$