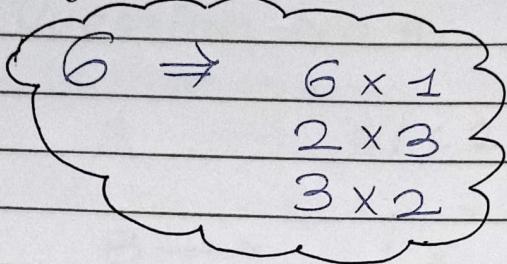


# HCF & LCM

Highest common factor



Also known as GCD

Find HCF of

$$\begin{array}{c|ccc} 2 & 42 & 54 & 36 \end{array}$$

$$\begin{array}{c|ccc} 3 & 21 & 27 & 18 \\ 3 & 7 & 9 & 6 \end{array}$$

$$\text{HCF} \geq 2 \times 3$$

$$\geq 6 //$$

Least common factor

$$2 \rightarrow 4 \ 6 \ 8 \ 10 \ 12 \ 14 \dots$$

$$\text{LCM}(2, 3) \Rightarrow 6$$

Find LCM

$$\begin{array}{c|cccc} 5 & 250 & 100 & 125 \\ 5 & 50 & 20 & 25 \\ 5 & 10 & 4 & 5 \\ 2 & 2 & 4 & 1 \\ 2 & 1 & 2 & 1 \end{array} \rightarrow 1 \cdot 1 \cdot 1$$

$$\begin{array}{r} 125 \\ \times 4 \\ \hline 500 \end{array}$$

~~(any)~~ LCM is 500 //

### Some IMP TIPS

HCF OF 18, 24, 30

See by observation  $\Rightarrow$

It is divisible by 6

then it becomes 3, 4, 5 and

after this it is not further divided. so

HCF is 6.

LCM OF 12, 36, 72, 144.

12, 36, 72, 144



72, 144



144

LCM OF 4 numbers are 144

To Find LCM OF 36, 48

12	36	48
3	3	4
1	1	1

\* NOT recommended when there is greater numbers.

$$\text{LCM OF } \left( \frac{1}{30} - \frac{1}{45} \right)$$

$$\begin{array}{rcl} 45 - 30 & \Rightarrow & 15 \\ 30 \times 45 & & 30 \times 45 \\ & & 2 \end{array} \Rightarrow \frac{1}{90}$$

Question No' 1

$$\text{LCM of fractions} = \frac{\text{LCM Numerator}}{\text{HCF Denominator}}$$

$$36 \quad 48 \quad 72$$

$$48 \quad 72$$

$$144$$

$$\text{HCF of Denom} = 5 //$$

$$\begin{array}{r} 5 \\ 225 \quad 150 \quad 65 \\ 45 \quad 30 \quad 13 \end{array}$$

$$\text{LCM of fraction} = \frac{144}{5}$$

Question No 2

$$\text{HCF of fraction} = \frac{\text{HCF of num}}{\text{LCM of Deno}}$$

$$\text{HCF} = 12$$

$$36 \quad 48 \quad 72$$

$$\text{LCM} =$$

~~$$7 \times 5 \quad 150 \quad 135$$~~

$$\begin{array}{r}
 & & 12 & 5 \\
 135 & 135 & 135 & | 150 \quad 135 \\
 \times 2 & 3 & \times 4 & 30 \quad 29 \\
 \hline
 270 & 405 & 540 & 30 \times 29 + 5 \\
 & & & \Rightarrow 4350 \\
 & & & \text{LCM} \rightarrow
 \end{array}$$

Question No 3

Greatest number  $\rightarrow$  GCD/HCF

Least Number  $\rightarrow$  LCM

Total Number  $\rightarrow$  LCM

'x' greatest Number

$$\frac{17}{x} \rightarrow 4$$

$$17 - 4 = \frac{13}{x}$$

$$x = 13$$

$$42 - 3 = \frac{39}{x}, \quad \frac{93 - 15}{x} = \frac{78}{x}$$

(Q.4)

Least Number  $\rightarrow$  LCM

$$\frac{x}{36} \quad \frac{x}{24} \quad \frac{x}{16}$$

4	36	24	16
3	9	6	4
2	3	2	4
2	1	1	2
<del>2</del>			1

$$\begin{array}{r}
 16 \quad 48 \\
 \times 9 \quad \times 16 \\
 \hline
 144 + 144 \\
 \hline
 288
 \end{array}$$

$$\begin{array}{r}
 16 \\
 3 \\
 48 \quad 36 \quad 24 \quad 16
 \end{array}$$

$$4 \times 3 \times 3 \times 2 \times 2$$

$$16 \times 9$$

$$(144 + 11)$$

$$\Rightarrow 155$$

\* Least number, R different Pattern

Question no 5

$$\text{LCM} \Rightarrow X$$

$$\begin{array}{r} X = 13 \\ \hline 20 \end{array} \quad \cancel{7}$$

$$\begin{array}{r} X = 41 \\ \hline 48 \end{array} \quad \cancel{7}$$

$$\begin{array}{r} X = 29 \\ \hline 36 \end{array} \quad \cancel{7}$$

$$\begin{array}{cccc} 4 & 20 & 48 & 36 \\ 5 & 5 & 12 & 9 \\ 3 & 1 & 12 & 9 \\ 4 & 0 & 4 & 3 \\ 3 & 8 & 1 & 1 \end{array}$$

$$4 \times 5 \times 3 \times 4 \times 3$$

$$\begin{array}{r} 60 \times 12 \\ \Rightarrow 720 \end{array}$$

$$\begin{array}{r} 720 - 7 \\ \Rightarrow 713 \end{array}$$

## Question No 6

2 12 16 18 20  
2 6 8 9 10  
3 3 4 9 5  
4 1 1 3 + 1  
5  
3

$$4 \times 4 \times 3 \times 3 \times 5$$

$$16 \times 9 \times 5$$

$$16 \times 45$$

$$\begin{array}{r} 3 \\ \times 45 \\ \hline \end{array}$$

$$\begin{array}{r} 1 \times 16 \\ \hline 270 \end{array}$$

$$45 \times$$

$$\begin{array}{r} 720 \\ \times 2 \\ \hline 1440 \end{array}$$

$$\boxed{720} + 21$$

$$720$$

$$21$$

$$\boxed{741}$$

$$1440$$

$$-21$$

$$\Rightarrow 1419$$

Q. #7)

$$\frac{x}{y} = \frac{5}{6}$$

$$\text{LCM} = 480$$

$$\text{HCF} = ?$$

Important  $\Rightarrow$ 

$$A \quad B$$

$$\text{HCF} \quad \text{LCM}$$

$$AB = \text{HCF} \times \text{LCM}$$

$$\text{e.g. } \frac{15}{A} \quad \frac{20}{B}$$

$$\text{HCF} = 5$$

$$\text{LCM} = 60$$

$$AB = 300$$

solution  $\Rightarrow$ 

$$480 \times k = 5 \times 6 \times k^2$$

$$\frac{480}{30} = k$$

$$\begin{array}{r} 1 \\ \boxed{K=16} \\ \hline 56 & 56 \\ 224 & \times 3 \\ \hline 168 & -56 \\ \hline 208 & -168 \\ \hline 40 & \end{array}$$

Q. #8

$$\text{LCM} = 96$$

$$\text{HCF} = 8$$

$$A + B = 56$$

$$\begin{array}{r} 96 \\ \times 8 \\ \hline 768 \end{array}$$

$$\begin{array}{r} 2877 \\ 56 \\ \hline 8 \times 96 \quad 16 \quad 768 \\ \hline A, 1 \quad \underline{B+A} \quad \underline{\frac{56}{768}} \\ \hline 7196 \end{array}$$

\* HCF, R same, subtract from individual

Q. 9)

$$\text{HCF} = X$$

$$\frac{47}{X} = \frac{35}{X} = \frac{27}{X}$$

$$47 \quad 35 \quad 27$$

$$\begin{array}{cccc} 2 & 12 & 8 & 20 \\ 2 & 6 & 4 & 10 \\ 3 & 2 & 5 & \end{array}$$

$$8 \times 3 \times 5$$

$$\text{HCF} \Rightarrow 4$$

Remaining is 3

Q. 10)

$$\begin{array}{r} 2 \quad 114 \\ 19 \quad 57 \\ \hline 3 \end{array} \quad \begin{array}{r} 76 \\ 38 \\ \hline 2 \end{array} \quad \begin{array}{r} 152 \\ 76 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 1 \\ 19 \end{array}$$

$$\boxed{\begin{array}{r} 2 \\ 38 \end{array}}$$

HCF means factor of that?

(Q. 11)

$$\text{HCF} = (x-4)$$

$$(x^2 - 8x + 15) \quad (x^2 - kx - 1)$$

$$4^2 - k \times 4 - 1 = 0$$

$$16 - 4k - 1 = 0$$

$$16 - 4k - 1 = 16 - 32 + 15$$

$$15 - 4k = 16 - 32 + 15$$

$$4k = 16$$

$$\therefore \boxed{k = 4}$$

(Q. 12)

Famous Pattern

Intervals  $\Rightarrow$  LCM

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

$$\begin{array}{r} 4 \\ \times 15 \\ \hline 120 \end{array}$$

$$\text{LCM} = 120 \text{ minutes}$$

$$\begin{array}{r} 12 \\ \times 4 \\ \hline \end{array}$$

$$8 \times 60$$

$$480 \text{ minutes}$$

4 times

## Question No 13

Same pattern  
easier to easily.

## Question No 14

$$\text{HCF OF } 50 \mid 450 \quad 350$$

$$9 - 7 - 01$$

50 cm

$$= 9 \quad 7$$

$$\text{NO.} = \frac{450}{\text{OF}} \times \frac{350}{\text{OF}}$$

$$59. \quad 5d \times 5\phi$$

$$= 63$$

=

## Question No 16

X X X 8 10 12

$$2 \quad 8 \quad 10 \quad 12$$

$$2 \quad 4 \quad 5 \quad 6$$

$$2 \quad 5 \quad 3$$

120

$$13) \overline{242}$$

$$\underline{-13} \quad 112$$

$$8 \times 15$$

$$\begin{array}{r} 4 \\ \times 15 \\ \hline 120 \end{array}$$

15

360

240

120

$$120 + 2$$

$$\boxed{122}$$

$$480$$

10 8

$$12) \overline{120}$$

$$\underline{-12} \quad 00$$