

HCF and LCM Quick Maths Formulas

1. Product of two numbers a and b ($a*b$) = Their HCF * Their LCM.
But $a*b*c \neq \text{HCF}*\text{LCM}$

#Note:

HCF of two or more numbers is the greatest number which divide all of them without any remainder.

LCM of two or more numbers is the smallest number which is divisible by all the given numbers.

2. HCF of given fractions = (HCF of Numerator)/(LCM of Denominator)
3. HCF of given fractions = (LCM of Denominator)/(HCF of Numerator)
4. If $d = \text{HCF}$ of a and b, then there exist unique integer m and n, such that $\rightarrow d = am + bn$.

Some important HCF and LCM Rules

✓ Factors and Multiples

If number a , divided another number b exactly, we say that a is a factor of b . In this case, b is called a multiple of a .

✓ Co-primes

Two numbers are said to be co-primes if their H.C.F. is 1.

✓ HCF of a given number always divides its LCM.

Methods of finding HCF of two or more numbers

➡ Method 1: Prime Factors Method

Break the given numbers into prime factors and then find the product of all the prime factors common to all the numbers.

The product will be the required HCF.

Example

If you have to find the HCF of 42 and 70.

Then $42 = 2 \times 3 \times 7$

And $72 = 2 \times 5 \times 7$

Common factors are – 2 and 7 so, $HCF = 2 \times 7 = 14$.

➡ Method 2: Division Method

Divide the greater number by the smaller number, divide the divisor by the remainder, divide the remainder by the next remainder and so on until no remainder is left. The last divisor is required HCF.

To check the complete procedure in example format, then please visit here – [Number System Division and Remainder Rules](#).

➡ Method 3: HCF of Large Numbers

Find the obvious common factor from both the numbers and remove it. Also remove the prime number (if any found).

Now perform division method to remaining numbers and find the HCF.

Check out the example for better understanding.

Example

If you have to find out the HCF of 42237 and 75582.

Then first check out for the common factor –

$$42237 = 4693 \times 9$$

$$75582 = 2 \times 9 \times 4199$$

Here we can remove 9 and 2 is a prime number so we can also extract this.

Now calculate with remaining numbers.

After performing Division method - $4693/4199$, we get the remainder 494.

Now the remainder 494 is divided by 2 but divisor 4199 is not.

So it should be proceeded further after dividing 494 by 2 i.e. 247.

Now performing division method as – $4199/247$, we get the remainder as 0.

Now by multiplying 247 with 9 we can have our required HCF i.e. $247 \times 9 = 2223$.

Methods of finding LCM of two or more numbers

➔ Method 1: Prime Factors Method

Resolve the given numbers into their Prime Factors and then find the product of the highest power of all the factors that occur in the given numbers. The product will be the LCM.

Example

LCM of 8,12,15 and 21.

$$\text{Now } 8 = 2 * 2 * 2 = 2^3$$

$$12 = 2 * 2 * 3 = 2^2 * 3$$

$$15 = 3 * 5$$

$$21 = 3 * 7$$

So highest power factors occurred are – 2^3 , 3, 5 and 7

$$\text{LCM} = 2^3 * 3 * 5 * 7 = 840.$$