Find the prime factorization of the following - 96

2|96
2|42
2|24
2|12
2|6
3

96 = 2X2X2X2X2X3 = 2^5X3

Find the prime factorization of the following - 408

2|408
2|204
2|102
3|51
17

408=2X2X2X3X17= 2^3X3X17

Find the prime factorization of the following - 2025

3|2025
3|675
3|225
3|75
5|25
5

2025 = 3X3X3X3X5X5 = 3^4X5^2

Express the following numbers as product of their primes: 49896

2|49896
2|24948
2|12474
3|6237
3|2079
3|693
3|231
7|77
11

49896= 2X2X2X3X3X3X3X7X11 = 2^3X3^4X7X11

Express the following numbers as product of their primes: 874944

2|874944
2|437472
2|218736
2|109368
2|54684
2|27342
3|13671
3|4557
7|1519
7|217
31

874944 = 2x2x2x2x2x2x3x3x7x7x31 = $2^6x3^2x7^2x31$

Find HCF and LCM of following pairs of integers by applying the fundamental theorem of arithmetic. 336 , 54

Solution

2 | 336	2 | 54
2 | 168	3 | 27
2 | 84	3 | 9
2 | 42	3
3 | 21	
7	

$336 = 2^4 X3X7$

$54=2X3^3$

HCF=2X3=6

LCM=$2^4 X3^3 X7$= 3024

Find HCF and LCM of following pairs of integers by applying the fundamental theorem of arithmetic. 225 , 867

Solution

3 | 225	3 | 867
3 | 75	17 | 289
5 | 25	17
5	

$225 = 3^2 X5^2$

$867=3X17^2$

HCF= 3

LCM= $3^2 X5^2 X17^2$ = 65025

PRIME FACTORISATION METHOD AND VERIFY THAT LCM X HCF = PRODUCT OF THE TWO NUMBERS

i) 26 , 91

26 = 2x13
91= 7x13
HCF= 13
LCM=2x7x13 = 182
HCFxLCM = 13x182 = 2366

Product of the numbers = 26x91 = 2366
:. HCFxLCM = Product of two number

ii) 21 , 315

21 = 3x7
315= 3^2 x 5 x 7
HCF= 21
LCM= 3^2 x 5 x 7 = 315
HCF x LCM = 21 x 315 = 2835

iii) 77, 979

77 = 11 x 7
979 = 11 x 89
HCF= 11
LCM= 11 x 7 x 89 = 6853
HCF x LCM = 11 x 6853 = 75383

Given that HCF (306, 657) = 9 , find LCM of 306 and 657

Solution

LCM X HCF = Product of two number

LCM = $\frac{\text{Product of two number}}{\text{HCF}}$

LCM = $\frac{306 \, x \, 657}{9}$

LCM = 34 x 657

LCM = 22338

Find the HCF and LCM of the following positive integers by applying the prime factorization method.

i) 24, 36, 176

Solution

$24 = 2^3 \times 3$

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

$176 = 2^4 \times 11$

HCF = $2^2 = 4$

LCM = $2^4 \times 3^2 \times 11 = 1584$

ii) 84, 90, 120

Solution

$84 = 2^3 \times 3 \times 7$

$90 = 2 \times 3^2 \times 5$

$120 = 2^3 \times 3 \times 5$

HCF = 2 X 3 = 6

LCM = $2^3 \times 3^2 \times 5 \times 7 = 2520$

iii) 112, 114, 168

Solution

$112 = 2^4 \times 7$

$144 = 2^3 \times 3^2$

$168 = 2^4 \times 3 \times 7$

HCF = $2^3 = 8$

LCM = $2^4 \times 3^2 \times 7 = 1008$

HCF of two numbers is 16 and their product is 3072. Find their LCM ?

Solution

LCM = $\frac{\text{Product of two number}}{\text{HCF}}$

LCM = $\frac{3072}{16}$

LCM = 192

Find the smallest number which when divided by 35, 56 and 91 leaves remainder 7 in each case .

Solution

The required number is 7 more than LCM of 35, 56 and 91

LCM of 35 , 56 and 91

$35 = 5 \times 7$

$56 = 2^3 \times 7$

$91 = 7 \times 13$

LCM = $5 \times 7 \times 2^3 \times 13$

Required number = 3640

= 3640 + 7 (7 is added so that will get the reminder 7 on dividing)

=3647

Find the smallest number which when increased by 11 is exactly divisible by 15, 20, 54

Solution

The required number will be less than 11 then LCM of 15, 20 and 54

LCM of 15 , 20 and 54

$15 = 3 \times 5$

$20 = 2^2 \times 5$

$54 = 2 \times 3^3$

LCM = $2^2 \times 3^3 \times 5 = 540$

Required number = 540 – 11 (11 is substracted from 540 , so that when we add it will be divisible by 15, 20 , 54)

=529