LCM & HCF

HCF Definition

The full form of HCF in Maths is Highest Common Factor.

As the rules of mathematics dictate, the greatest common divisor or the gcd of two or more positive integers happens to be the largest positive integer that divides the numbers without leaving a remainder. For example, take 8 and 12. The H.C.F. of 8 and 12 will be 4 because the highest number that can divide both 8 and 12 is 4.

LCM Definition

The full form of LCM in Maths is Least Common Multiple.

In arithmetic, the least common multiple or LCM of two numbers say a and b, is denoted as LCM (a,b). And the LCM is the smallest or least positive integer that is divisible by both a and b.

Product of Two numbers = (HCF of the two numbers) x (LCM of the two numbers)

HCF by Prime Factorization Method

Take an example of finding the highest common factor of 144, 104 and 160.
Now let us write the prime factors of 144, 104 and 160.
144 = 2 × 2 × 2 × 2 × 3 × 3
104 = 2 × 2 × 2 × 13
160 = 2 × 2 × 2 × 2 × 2 × 5
The common factors of 144, 104 and 160 are 2 × 2 × 2 = 8
Therefore, HCF (144, 104, 160) = 8

LCM by Prime Factorization Method

To calculate the LCM of two numbers 60 and 45. Out of other ways, one way to find the LCM of given numbers is as below:

List the prime factors of each number first.

60 = 2 × 2 x 3 × 5

45 = 3 × 3 × 5

Then multiply each factor the most number of times it occurs in any number. If the same multiple occurs more than once in both the given numbers, then multiply the factor by the most number of times it occurs.

The occurrence of Numbers in the above example:

2: two times

3: two times

5: one time

LCM = 2 × 2 x 3 × 3 × 5 = 180

H.C.F AND L.C.M

Q 1. Find the H.C.F. of 42, 63 and 140:

(a) 14 (b) 9 (c) 21 (d) 7

H.C.F AND L.C.M

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(a) 14 (b) 9 (c) 21 (d) 7

H.C.F AND L.C.M

Q 2. Find the H.C.F. of $a^2b^4c^6$, $b^3c^8a^4$ and $a^8b^6c^2$.

(a) $a^4b^4c^4$ (b) $a^2b^2c^2$ (c) $a^2b^3c^2$ (d) $a^2b^3c^3$

H.C.F AND L.C.M

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(a) $a^4b^4c^4$ (b) $a^2b^2c^2$ (c) $a^2b^3c^2$ (d) $a^2b^3c^3$

ANS:- c

H.C.F AND L.C.M

Q 3. Find the H.C.F. of $2^2\,3^3\,5^5$, $2^3\,3^2\,5^2\,7$ and $2^4\,3^4\,5\,7^2\,11$.

(a) $2^2 3^2\,5$ (b) $2^2 3^2\,5\,7\,11$ (c) $2^4\,3^4\,5$ (d) $2^4\,3^4\,5^5\,7\,11$

H.C.F AND L.C.M

Q 3. Find the H.C.F. of $2^2\,3^3\,5^5$, $2^3\,3^2\,5^2\,7$ and $2^4\,3^4\,5\,7^2\,11$.

(a) $2^2 3^2\,5$ (b) $2^2 3^2\,5\,7\,11$ (c) $2^4\,3^4\,5$ (d) $2^4\,3^4\,5^5\,7\,11$

H.C.F AND L.C.M

Q 4. Find the H.C.F. of $\frac{2}{3}, \frac{8}{9}, \frac{64}{81}$ and $\frac{10}{27}$.

(a) $\frac{2}{3}$ (b) $\frac{2}{81}$ (c) $\frac{160}{3}$ (d) $\frac{160}{81}$

H.C.F AND L.C.M

Q 4. Find the H.C.F. of $\frac{2}{3}, \frac{8}{9}, \frac{64}{81}$ and $\frac{10}{27}$.

(a) $\frac{2}{3}$ (b) $\frac{2}{81}$ (c) $\frac{160}{3}$ (d) $\frac{160}{81}$

ANS:- b

H.C.F AND L.C.M

Q 5. Find the maximum number of students among whom 1001 pens and 910 pencils can be distributed in such a way that each student gets the same number of pens and the same number of pencils.

(a) 91 (b) 910 (c) 1001 (d) 1911

H.C.F AND L.C.M

Q 5. Find the maximum number of students among whom 1001 pens and 910 pencils can be distributed in such a way that each student gets the same number of pens and the same number of pencils.

(a) 91 (b) 910 (c) 1001 (d) 1911

H.C.F AND L.C.M

Q 6. Find the greatest possible length of a scale that can be used to measure exactly the following length of cloth 3m; 5m 10cm; and 12m 90cm.

(a) 30 cm **(b) 60 cm** **(c) 10 cm** **(d) 1290 cm**

H.C.F AND L.C.M

Q 6. Find the greatest possible length of a scale that can be used to measure exactly the following length of cloth 3m; 5m 10cm; and 12m 90cm.

(a) 30 cm **(b) 60 cm** **(c) 10 cm** **(d) 1290 cm**

H.C.F AND L.C.M

Q 7. Three containers have the mixture of milk and water 403 liters, 713 liters and 496 liters respectively. Find the greatest measurement which can measure the mixture.

(a) 1 liter **(b) 7 liters** **(c) 31 liters** **(d) 41 liters**

H.C.F AND L.C.M

Q 7. Three containers have the mixture of milk and water 403 liters, 713 liters and 496 liters respectively. Find the greatest measurement which can measure the mixture.

(a) 1 liter (b) 7 liters (c) 31 liters (d) 41 liters

H.C.F AND L.C.M

Q 8. Traffic lights at three different points are changing respectively at 24, 48 and 72 second. If all the three are changed together at 9 : 10 : 24 hours, when will the next changes take place together?

(a) 9 :12 : 25 hrs (b) 9 :10 : 48 hrs (c) 9 :12 : 48 hrs

(d) 9 :12 : 40 hrs

H.C.F AND L.C.M

Q 8. Traffic lights at three different points are changing respectively at 24, 48 and 72 second. If all the three are changed together at 9 : 10 : 24 hours, when will the next changes take place together?

(a) 9 :12 : 25 hrs (b) 9 :10 : 48 hrs (c) 9 :12 : 48 hrs (d) 9 :12 : 40 hrs

H.C.F AND L.C.M

Q 9. A, B and C start at the same time in the same direction to run around a circular stadium of length 12 km and their speeds are 3 km/h, 4 km/h and 6 km/h respectively. After what time will they meet again at the starting point?

(a) 16 h (b) 12 h (c) 24 h (d) 28 h

H.C.F AND L.C.M

Q 9. A, B and C start at the same time in the same direction to run around a circular stadium of length 12 km and their speeds are 3 km/h, 4 km/h and 6 km/h respectively. After what time will they meet again at the starting point?

(a) 16 h (b) 12 h (c) 24 h (d) 28 h

H.C.F AND L.C.M

Q 10. The smallest number is exactly divisible by 2, 4, 3, 5, 6, 8 and 10 when 7 is subtracted from the number. What is the number?

(a) 113 (b) 120 (c) 127 (d) 137

H.C.F AND L.C.M

Q 10. The smallest number is exactly divisible by 2, 4, 3, 5, 6, 8 and 10 when 7 is subtracted from the number. What is the number?

(a) 113 (b) 120 (c) 127 (d) 137

H.C.F AND L.C.M

Q 11. The smallest number to which if 8 added, is exactly divisible by 10, 12, 15 and 20-

(a) 60 (b) 68 (c) 52 (d) 38

H.C.F AND L.C.M

Q 11. The smallest number to which if 8 added, is exactly divisible by 10, 12, 15 and 20-

(a) 60 (b) 68 (c) 52 (d) 38

H.C.F AND L.C.M

Q 12. Which is the smallest number that can be subtracted from 1936 so that on being divided by 9, 10, 15 the remainder is 7 every time?

(a) 93 (b) 46 (c) 76 (d) 39

H.C.F AND L.C.M

Q 12. Which is the smallest number that can be subtracted from 1936 so that on being divided by 9, 10, 15 the remainder is 7 every time?

(a) 93 (b) 46 (c) 76 (d) 39

H.C.F AND L.C.M

Q 13. The smallest number that will be divisible by 4, 6, 8, 12 and 16 leaving a remainder 2 in each case is-

(a) 46 (b) 50 (c) 48 (d) 56

H.C.F AND L.C.M

Q 13. The smallest number that will be divisible by 4, 6, 8, 12 and 16 leaving a remainder 2 in each case is-

(a) 46 (b) 50 (c) 48 (d) 56

H.C.F AND L.C.M

Q 14. Find the greatest number that will divide 187, 233 and 279 so as to leave the same remainder in each case.

(a) 30 **(b) 36** **(c) 46** **(d) 56**

H.C.F AND L.C.M

Q 14. Find the greatest number that will divide 187, 233 and 279 so as to leave the same remainder in each case.

(a) 30 (b) 36 (c) 46 (d) 56

H.C.F AND L.C.M

Q 15. The numbers 2272 and 875 divided by a three-digit number N, giving the same remainder. The sum of the digits of N is-

(a) 13 (b) 10 (c) 14 (d) 11

H.C.F AND L.C.M

Q 15. The numbers 2272 and 875 divided by a three-digit number N, giving the same remainder. The sum of the digits of N is-

(a) 13 (b) 10 (c) 14 (d) 11

H.C.F AND L.C.M

Q 16. The greatest number which can divide 110 and 128 leaving the same remainder 2 in each case, is-

(a) 8 (b) 18 (c) 28 (d) 38

H.C.F AND L.C.M

Q 16. The greatest number which can divide 110 and 128 leaving the same remainder 2 in each case, is-

(a) 8 (b) 18 (c) 28 (d) 38

H.C.F AND L.C.M

Q 17. The greatest number which can divide 122 and 243 and leave remainders 2 and 3 respectively, is-

(a) 12 (b) 24 (c) 30 (d) 120

H.C.F AND L.C.M

Q 17. The greatest number which can divide 122 and 243 and leave remainders 2 and 3 respectively, is-

(a) 12 (b) 24 (c) 30 (d) 120

H.C.F AND L.C.M

Q 18. The least number, which when divided by 5, 6, 7 and 8 leaves a remainders 3, but when it is divided by 9 leaves no remainder, is-

(a) 1677 (b) 1683 (c) 2523 (d) 3363

H.C.F AND L.C.M

Q 18. The least number, which when divided by 5, 6, 7 and 8 leaves a remainders 3, but when it is divided by 9 leaves no remainder, is-

(a) 1677 (b) 1683 (c) 2523 (d) 3363

H.C.F AND L.C.M

Q 19. The least number, which when divided by 20, 25, 35 and 40 leaves remainder 14, 19, 29 and 34 respectively, is-

(a) 1400 (b) 1394 (c) 1406 (d) 1388

H.C.F AND L.C.M

Q 19. The least number, which when divided by 20, 25, 35 and 40 leaves remainder 14, 19, 29 and 34 respectively, is-

(a) 1400 (b) 1394 (c) 1406 (d) 1388

H.C.F AND L.C.M

Q 20. Find the largest 5 digits number exactly divisible by 12, 16, 18, 24, 32.

(a) 99936 (b) 99963 (c) 99972 (d) 99982

H.C.F AND L.C.M

Q 20. Find the largest 5 digits number exactly divisible by 12, 16, 18, 24, 32.

(a) 99936 (b) 99963 (c) 99972 (d) 99982

H.C.F AND L.C.M

Q 21. Find the smallest 5 digits number exactly divisible by 16, 24, 36 and 54.

(a) 10432 (b) 10368 (c) 10064 (d) 10054

H.C.F AND L.C.M

Q 21. Find the smallest 5 digits number exactly divisible by 16, 24, 36 and 54.

(a) 10432 (b) 10368 (c) 10064 (d) 10054

H.C.F AND L.C.M

Q 22. The LCM of two numbers is 1296 and HCF is 96. If one of the numbers is 864 then the other is-

(a) 72 (b) 64 (c) 144 (d) 36

H.C.F AND L.C.M

Q 22. The LCM of two numbers is 1296 and HCF is 96. If one of the numbers is 864 then the other is-

(a) 72 (b) 64 (c) 144 (d) 36

H.C.F AND L.C.M

Q 23. The H.C.F. of two numbers is 11 and their LCM is 7700. If one of the number is 275, then the other is:

(a) 279 (b)283 (c) 308 (d) 318

H.C.F AND L.C.M

Q 23. The H.C.F. of two numbers is 11 and their LCM is 7700. If one of the number is 275, then the other is:

(a) 279 (b)283 (c) 308 (d) 318

H.C.F AND L.C.M

Q 24. The L.C.M of two numbers is 495 and their H.C.F is 5. If the sum of the number is 100, then their difference is-

(a) 10 (b) 46 (c) 70 (d) 90

H.C.F AND L.C.M

Q 24. The L.C.M of two numbers is 495 and their H.C.F is 5. If the sum of the number is 100, then their difference is-

(a) 10 (b) 46 (c) 70 (d) 90

H.C.F AND L.C.M

Q 25. The product of the L.C.M and H.C.F of two numbers is 24. The difference of two numbers is 2. Find the numbers-

(a) 2 and 4 (b) 6 and 4 (c) 8 and 6 (d) 8 and 10

H.C.F AND L.C.M

Q 25. The product of the L.C.M and H.C.F of two numbers is 24. The difference of two numbers is 2. Find the numbers-

(a) 2 and 4 (b) 6 and 4 (c) 8 and 6 (d) 8 and 10

H.C.F AND L.C.M

Q 26. The L.C.M of two numbers is 45 times of their H.C.F. If one of the numbers is 125 and the sum of H.C.F and L.C.M of two numbers is 1150, the other number is-

(a) 215 (b) 220 (c) 225 (d) 235

H.C.F AND L.C.M

Q 26. The L.C.M of two numbers is 45 times of their H.C.F. If one of the numbers is 125 and the sum of H.C.F and L.C.M of two numbers is 1150, the other number is-

(a) 215 (b) 220 (c) 225 (d) 235

H.C.F AND L.C.M

Q 27. Product of two co-prime numbers is 117. Their L.C.M should be-

(a) 1 (b) 117 (c) equal to HCF (d) cannot be calculated

H.C.F AND L.C.M

Q 28. Product of two co-prime numbers is 117. Their L.C.M should be-

(a) 1 (b) 117 (c) equal to HCF (d) cannot be calculated

H.C.F AND L.C.M

Q 29. H.C.F. of 3240, 3600 and a third number, is 36 and their LCM is $2^4.3^5.5^2.7^2$. The third number is-

(a) $2^2 \cdot 3^5 \cdot 7^2$ (b) $2^2 \cdot 5^3 \cdot 7^2$ (c) $2^5 \cdot 5^2 \cdot 7^2$ (d) $2^3 \cdot 3^5 \cdot 7^2$

H.C.F AND L.C.M

Q 29. H.C.F. of 3240, 3600 and a third number, is 36 and their LCM is $2^4.3^5.5^2.7^2$. The third number is-

(a) $2^2 \cdot 3^5 \cdot 7^2$ (b) $2^2 \cdot 5^3 \cdot 7^2$ (c) $2^5 \cdot 5^2 \cdot 7^2$ (d) $2^3 \cdot 3^5 \cdot 7^2$

ANS:- a

H.C.F AND L.C.M

Q 30. The ratio of two numbers is 4:5 and their HCF is 2. The LCM is-

(a) 20 (b) 10 (c) 40 (d) 60

H.C.F AND L.C.M

Q 30. The ratio of two numbers is 4:5 and their HCF is 2. The LCM is-

(a) 20 (b) 10 (c) 40 (d) 60

H.C.F AND L.C.M

Q 31. The ratio of two numbers is 3:2 and their LCM is 72. Their HCF is-

(a) 24 (b) 3 (c) 6 (d) 12

H.C.F AND L.C.M

Q 31. The ratio of two numbers is 3:2 and their LCM is 72. Their HCF is-

(a) 24 (b) 3 (c) 6 (d) 12

H.C.F AND L.C.M

Q 32. The sum of two numbers is 36 and their HCF is 4. How many number of pairs may be possible-

(a) 1 (b) 2 (c) 3 (d) 4

H.C.F AND L.C.M

Q 32. The sum of two numbers is 36 and their HCF is 4. How many number of pairs may be possible-

(a) 1 (b) 2 (c) 3 (d) 4

H.C.F AND L.C.M

Q 33. A number when divided by 10 leaves a remainder 9, when divided by 9 leaves a remainder of 8, when divided by 8 leaves a remainder of 7 and so on. When divided by 2 leaves a remainder of 1. Find the number :

(a) 31 (b) 1029 (c) 2519 (d) 1679

H.C.F AND L.C.M

Q 33. A number when divided by 10 leaves a remainder 9, when divided by 9 leaves a remainder of 8, when divided by 8 leaves a remainder of 7 and so on. When divided by 2 leaves a remainder of 1. Find the number :

(a) 31 (b) 1029 (c) 2519 (d) 1679

THANK YOU