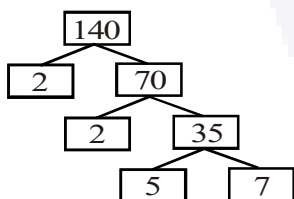


Class X : MATH
Chapter - 1 : Real Number
Questions & Answers - Exercise : 1.1 - NCERT Book

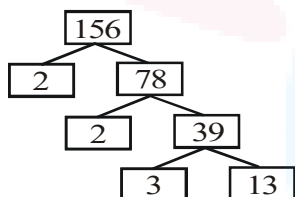
Q1. Express each number as product of its prime factors :
 (i) 140 (ii) 156 (iii) 3825 (iv) 5005 (v) 7429

Sol. (i) 140



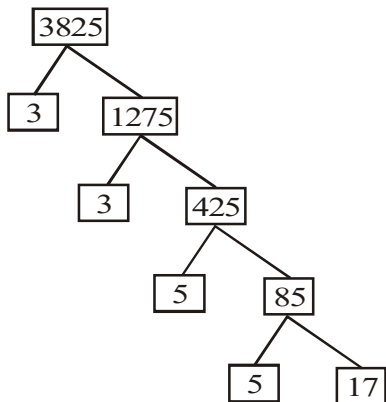
So, $140 = 2 \times 2 \times 5 \times 7 = 2^2 \times 5 \times 7$

(ii) 156



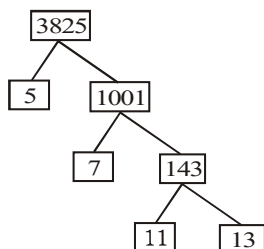
So, $156 = 2 \times 2 \times 3 \times 13 = 2^2 \times 3 \times 13$

(iii)



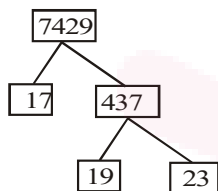
So, $3825 = 3^2 \times 5^2 \times 17$

(iv) 5005



So, $5005 = 5 \times 7 \times 11 \times 13$

(v) 7429



So, $7429 = 17 \times 19 \times 23$

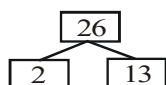
Q2. Find the LCM and HCF of the following pairs of integers and verify that $\text{LCM} \times \text{HCF} =$ product of two numbers.

(i) 26 and 91

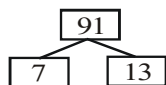
(ii) 510 and 92

(iii) 336 and 54

Sol. (i) 26 and 91



So, $26 = 2 \times 13$



So, $91 = 7 \times 13$

Therefore,

$$\text{LCM}(26, 91) = 2 \times 7 \times 13 = 182$$

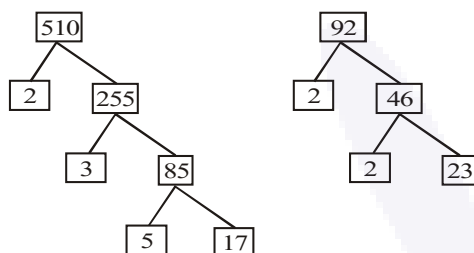
$$\text{HCF}(26, 91) = 13$$

$$\text{Verification : LCM} \times \text{HCF} = 182 \times 13 = 2366$$

$$\text{and } 26 \times 91 = 2366$$

i.e., $\text{LCM} \times \text{HCF} = \text{product of two numbers.}$

(ii) 510 and 92



$$510 = 2 \times 3 \times 5 \times 17, 92 = 2^2 \times 23$$

$$\text{LCM}(510, 92) = 2^2 \times 3 \times 5 \times 17 \times 23 = 23460$$

$$\text{HCF} = (510, 92) = 2$$

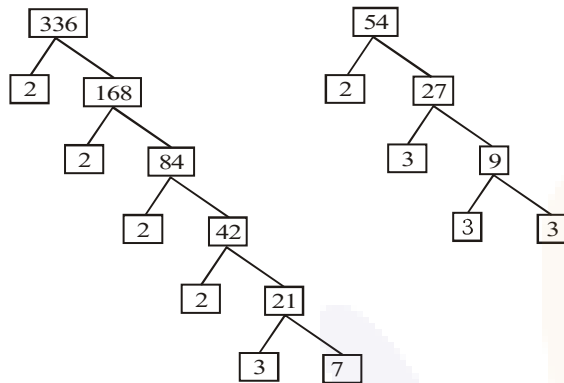
Verification :-

$$\text{LCM} \times \text{HCF} = 23460 \times 2 = 46920$$

$$\text{and } 510 \times 92 = 46920$$

i.e., $\text{LCM} \times \text{HCF} = \text{product of two numbers.}$

(iii) 336 and 54



$$336 = 2^4 \times 3 \times 7$$

$$54 = 2 \times 3^3$$

$$\text{LCM} = 2^4 \times 3^3 \times 7 = 3024$$

$$\text{HCF} = 2 \times 3 = 6$$

Verification,

$$\text{LCM} \times \text{HCF} = 2^4 \times 3^3 \times 7 \times 2 \times 3 = 18144$$

$$\text{Product of two numbers} = 336 \times 54 = 18144$$

i.e., $\text{LCM} \times \text{HCF} = \text{product of two numbers}$.

Q3. Find the LCM and HCF of the following integers by applying the prime factorisation method.

(i) 12, 15 and 21 (ii) 17, 23 and 29 (iii) 8, 9 and 25

Sol. (i) 12, 15 and 21

$$\text{So, } 12 = 2 \times 2 \times 3 = 2^2 \times 3$$

$$\text{So, } 15 = 3 \times 5$$

$$\text{So, } 21 = 3 \times 7$$

Therefore,

$$\text{HCF} (12, 15, 21) = 3 ;$$

$$\text{LCM} = (12, 15, 21) = 2^2 \times 3 \times 5 \times 7 = 420$$

(ii) 17, 23, 29

$$17 = 1 \times 17$$

$$23 = 1 \times 23$$

$$29 = 1 \times 29$$

$$\text{LCM} = 1 \times 17 \times 23 \times 29$$

$$\text{HCF} = 1$$

(iii) 8, 9, 25

$$8 = 2 \times 2 \times 2$$

$$9 = 3 \times 3$$

$$25 = 5 \times 5$$

$$\text{LCM} = 2^3 \times 3^2 \times 5^2$$

$$\text{HCF} = 1$$

Q4. Given that $\text{HCF}(306, 657) = 9$, find $\text{LCM}(306, 657)$.

Sol. $\text{LCM}(306, 657)$

$$= \frac{306 \times 657}{\text{HCF}(306, 657)} = \frac{306 \times 657}{9} = 22338.$$

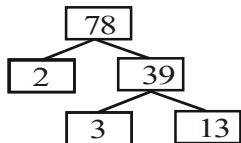
Q5. Check whether 6^n can end with the digit 0 for any natural number n .

Sol. If the number 6^n , for any natural number n , ends with digit 0, then it would be divisible by 5. That is, the prime factorisation of 6^n would contain the prime number 5. This is not possible because $6^n = (2 \times 3)^n = 2^n \times 3^n$; so the only primes in the factorisation of 6^n are 2 and 3 and the uniqueness of the Fundamental Theorem of Arithmetic guarantees that there are no other primes in the factorisation of 6^n . So, there is no natural number n for which 6^n ends with the digit zero.

Q6. Explain why $7 \times 11 \times 13 + 13$ and $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ are composite numbers.

Sol. (i) $7 \times 11 \times 13 + 13 = (7 \times 11 + 1) \times 13$

$$\begin{aligned}
 &= (77 + 1) \times 13 \\
 &= 78 \times 13 = (2 \times 3 \times 13) \times 13 \\
 \text{So, } &78 = 2 \times 3 \times 13 \\
 &78 \times 13 = 2 \times 3 \times 13^2
 \end{aligned}$$



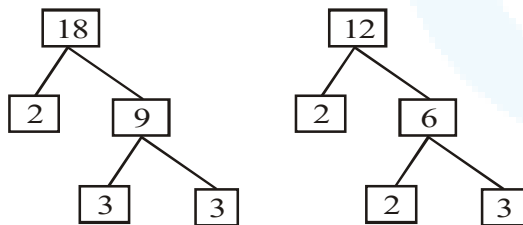
Since, $7 \times 11 \times 13 + 13$ can be expressed as a product of primes, therefore, it is a composite number.

$$\begin{aligned}
 \text{(ii)} \quad &7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5 \\
 &= (7 \times 6 \times 4 \times 3 \times 2 \times 1 + 1) \times 5 \\
 &= 1009 \times 5
 \end{aligned}$$

Since, $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ can be expressed as a product of primes, therefore it is a composite number.

- Q7.** There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?

Sol. LCM of 18 & 12.



$$18 = 2 \times 3^2$$

$$12 = 2^2 \times 3$$

$$\text{LCM}(18, 12) = 2^2 \times 3^2 = 36$$

Thus, after 36 minutes they will meet again at the starting point.