

EXERCISE 1.1

- Express each number as a product of its prime factors:
(i) 140 (ii) 156 (iii) 3825 (iv) 5005 (v) 7429
- Find the LCM and HCF of the following pairs of integers and verify that $\text{LCM} \times \text{HCF} =$ product of the two numbers.
(i) 26 and 91 (ii) 510 and 92 (iii) 336 and 54
- 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
- Given that $\text{HCF}(306, 657) = 9$, find $\text{LCM}(306, 657)$.
- Check whether 6^n can end with the digit 0 for any natural number n .
- 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.
- 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

Question 1

Express each number as a product of its prime factors.

Solution

(i) 140

$$140 = 2 \times 70$$

$$= 2 \times 2 \times 35$$

$$= 2 \times 2 \times 5 \times 7$$

$$\mathbf{140 = 2^2 \times 5 \times 7}$$

(ii) 156

$$156 = 2 \times 78$$

$$= 2 \times 2 \times 39$$

$$= 2 \times 2 \times 3 \times 13$$

$$\mathbf{156 = 2^2 \times 3 \times 13}$$

(iii) 3825

$$3825 = 5 \times 765$$

$$= 5 \times 5 \times 153$$

$$= 5 \times 5 \times 3 \times 51$$

$$= 5 \times 5 \times 3 \times 3 \times 17$$

$$\mathbf{3825 = 3^2 \times 5^2 \times 17}$$

(iv) 5005

$$5005 = 5 \times 1001$$

$$= 5 \times 7 \times 143$$

$$= 5 \times 7 \times 11 \times 13$$

$$\mathbf{5005 = 5 \times 7 \times 11 \times 13}$$

(v) 7429

$$7429 = 17 \times 437$$

$$= 17 \times 19 \times 23$$

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

Question 2

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

Solution

(i) 26 and 91

$$26 = 2 \times 13$$

$$91 = 7 \times 13$$

$$\text{HCF} = 13$$

$$\text{LCM} = 2 \times 7 \times 13 = 182$$

Verification:

$$182 \times 13 = 2366$$

$$26 \times 91 = 2366$$

(ii) 510 and 92

$$510 = 2 \times 3 \times 5 \times 17$$

$$92 = 2^2 \times 23$$

$$\text{HCF} = 2$$

$$\text{LCM} = 2^2 \times 3 \times 5 \times 17 \times 23 = 23460$$

Verification:

$$23460 \times 2 = 46920$$

$$510 \times 92 = 46920$$

(iii) 336 and 54

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

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

$$\text{HCF} = 6$$

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

Verification:

$$3024 \times 6 = 18144$$

$$336 \times 54 = 18144$$

Question 3

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

Solution

(i) 12, 15 and 21

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

$$15 = 3 \times 5$$

$$21 = 3 \times 7$$

$$\text{HCF} = 3$$

$$\text{LCM} = 2^2 \times 3 \times 5 \times 7 = 420$$

(ii) 17, 23 and 29

All the numbers are prime numbers.

$$\text{HCF} = 1$$

$$\text{LCM} = 17 \times 23 \times 29 = 11339$$

(iii) 8, 9 and 25

$$8 = 2^3$$

$$9 = 3^2$$

$$25 = 5^2$$

$$\text{HCF} = 1$$

$$\text{LCM} = 2^3 \times 3^2 \times 5^2 = 1800$$

Question 4

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

Solution

We know that,

$\text{HCF} \times \text{LCM} = \text{Product of the two numbers}$

$$9 \times \text{LCM} = 306 \times 657$$

$$\text{LCM} = (306 \times 657) \div 9$$

$$\text{LCM} = 201042 \div 9$$

$$\text{LCM} = 22338$$

Question 5

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

Solution

$$6 = 2 \times 3$$

Therefore,

$$\begin{aligned} 6^n &= (2 \times 3)^n \\ &= 2^n \times 3^n \end{aligned}$$

A number ends with digit 0 only if it contains the factors 2 and 5.

But 6^n contains only the factors 2 and 3 and no factor 5.

Therefore, 6^n cannot end with the digit 0 for any natural number n .

Question 6

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.

Solution

(i) $7 \times 11 \times 13 + 13$

$$= 13 (7 \times 11 + 1)$$

$$= 13 (77 + 1)$$

$$= 13 \times 78$$

Since it has factors other than 1 and itself, it is a composite number.

$$(ii) 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$$

$$= 5 (7 \times 6 \times 4 \times 3 \times 2 \times 1 + 1)$$

$$= 5 (1008 + 1)$$

$$= 5 \times 1009$$

Since it has factors other than 1 and itself, it is also a composite number.

Question 7

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?

Solution

They will meet again after the LCM of 18 and 12.

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

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

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

$$= 4 \times 9$$

$$= 36$$

Therefore, they will meet again after 36 minutes.