EXERCISE 2.11   **PAGE: 2.40**

1. For each of the following pairs of numbers, verify the property:
Product of the number = Product of their HCF and LCM
(i) 25, 65
(ii) 117, 221
(iii) 35, 40
(iv) 87, 145
(v) 490, 1155
Solution:

(i) 25, 65
Prime factorization of
25 = 5 × 5
65 = 5 × 13
So we get
HCF of 25, 65 = 5
LCM of 25 ,65 = 5 × 5 × 13 = 325

So we get the product of numbers = 25 × 65 = 1625
Product of HCF and LCM = 5 × 325 = 1625

Hence, it is verified that product of the number = product of their HCF and LCM.

(ii) 117, 221
Prime factorization of
117 = 3 × 3 × 13
221 = 13 × 17
So we get
HCF of 117, 221 = 13
LCM of 117, 221 = 3 × 3 × 13 × 17 = 1989

So we get the product of numbers = 117 × 221 = 25857
Product of HCF and LCM = 13 × 1989 = 25857

Hence, it is verified that product of the number = product of their HCF and LCM.

(iii) 35, 40
Prime factorization of
35 = 5 × 7
40 = 2 × 2 × 2 × 5
So we get
HCF of 35, 40 = 5
LCM of 35, 40 = 2 × 2 × 2 × 5 × 7 = 280

So we get the product of numbers = 35 × 40 = 1400
Product of HCF and LCM = 5 × 280 = 1400

Hence, it is verified that product of the number = product of their HCF and LCM.

(iv) 87, 145
Prime factorization of
87 = 3 × 29
145 = 5 × 29
So we get
HCF of 87, 145 = 29
LCM of 87, 145 = 3 × 5 × 29 = 435

So we get the product of numbers = 87 × 145 = 12615
Product of HCF and LCM = 29 × 435 = 12615

Hence, it is verified that product of the number = product of their HCF and LCM.

(v) 490, 1155
Prime factorization of
490 = 2 × 5 × 7 × 7
1155 = 3 × 5 × 7 × 11
So we get
HCF of 490, 1155 = 35
LCM of 490, 1155 = 2 × 3 × 5 × 7 × 7 × 11 = 16170

So we get the product of numbers = 490 × 1155 = 565950
Product of HCF and LCM = 35 × 16170 = 565950

Hence, it is verified that product of the number = product of their HCF and LCM.

2. Find the HCF and LCM of the following pairs of numbers:
(i) 117, 221
(ii) 234, 572
(iii) 145, 232
(iv) 861, 1353
Solution:

(i) 117, 221
Prime factorization of
117 = 3 × 3 × 13
221 = 13 × 17
So the required HCF = 13
Required LCM = 3 × 3 × 13 × 17 = 1989

(ii) 234, 572
Prime factorization of
234 = 2 × 3 × 3 × 13
572 = 2 × 2 × 11 × 13
So the required HCF = 26
Required LCM = 2 × 2 × 3 × 3 × 11 × 13 = 5148

(iii) 145, 232
Prime factorization of
145 = 5 × 29

232 = 2 × 2 × 2 × 29
So the required HCF = 29
Required LCM = 2 × 2 × 2 × 5 × 29 = 1160

(iv) 861, 1353
Prime factorization of
861 = 3 × 7 × 41
1353 = 3 × 11 × 41
So the required HCF = 123
Required LCM = 3 × 7 × 11 × 41 = 9471

3. The LCM and HCF of two numbers are 180 and 6 respectively. If one of the numbers is 30, find the other number.
Solution:

It is given that
LCM of two numbers = 180
HCF of two numbers = 6
One of the number = 30

We know that
Product of two numbers = Product of HCF and LCM
So we get
30 × other number = 6 × 180
On further calculation
Other number = (6 × 180)/ 30 = 36

Hence, the other number is 36.

4. The HCF of two numbers is 16 and their product is 3072. Find their LCM.
Solution:

It is given that
HCF of two numbers = 16
Product = 3072

We know that
Product of two numbers = Product of HCF and LCM
So we get
3072 = 16 × LCM
On further calculation
LCM = 3072/ 16 = 192

Therefore, the LCM of two numbers is 192.

5. The HCF of two numbers is 145, their LCM is 2175. If one number is 725, find the other.
Solution:

It is given that
HCF of two numbers = 145

LCM = 2175

We know that
Product of two numbers = Product of HCF and LCM
So we get
725 × other number = 145 × 2175
On further calculation
Other number = (145 × 2175)/ 725 = 435

Therefore, the other number is 435.

6. Can two numbers have 16 as their HCF and 380 as their LCM? Give reason.
Solution:

No. HCF of two numbers must exactly divide their LCM
We know that 16 does not divide 380 exactly

Therefore, no two numbers can exist with 16 as HCF and 380 as LCM.