Chapter 1
Real numbers

EXERCISE 1.2

1. Express each number as a product of its prime factors:
(i) 140

Solution:
140 = 2×2×5×7 = 2^2×5×7

(ii) 156
Solution:
156 = 2×2×3×13 = 2^2×3×13

(iii) 3825
Solution:
3825 = 3×3×5×5×17 = 3^2×5^2×17

(iv) 5005
Solution:
5005 = 5×7×11×13

(v) 7429
Solution:
7429 = 17×19×23

2. Find the LCM and HCF of the following pairs of integers and verify that LCM × HCF = product of the two numbers.
(i) 26 and 91
Solution:
26 = 2×13
91 = 7×13
HCF =13
LCM = 2×17×13 =182
Product of the two numbers = 26×91 = 2366
HCF×LCM = 13×182 = 2366
Hence, product of two numbers = HCF×LCM

(ii) 510 and 92
Solution:
510 = 2×3×5×17
92 = 2×2×23
HCF = 2
LCM = 2×2×3×5×17×23 = 23460
Product of the two numbers = 510×92 = 46920

HCF×LCM = 2×23460

HCF×LCM = 46920

Hence, product of two numbers = HCF×LCM

(iii) 336 and 54

Solution:

336 = 2×2×2×2×3×7

336 = 2^4×3×7

54 = 2×3×3×3

54 =2×3^3

HCF = 2×3 = 6

LCM = 2^4×3^3×7 = 3024

Product of the two numbers = 336×54 = 18144

HCF×LCM = 6×3024 = 18144

Hence, product of two numbers = HCF×LCM

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

(i) 12, 15 and 21

Solution:

12 = 2×2×3 = 2^2×3

15 = 3×5

21 = 3×7

HCF = 3

LCM = 2^2×3×5×7 = 420

(ii) 17, 23 and 29

Solution:

17 = 1×17

23 = 1×23

29 = 1×29

HCF = 1

LCM = 17×23×29 = 11339

(iii) 8, 9 and 25

Solution:

8=2×2×2

9 = 3×3

25 = 5×5

HCF = 1

LCM = 2×2×2×3×3×5×5 = 1800

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

Solution:

HCF of (306, 657) = 9

We know that,

LCM×HCF = product of two numbers

LCM×HCF = 306×657

LCM = $\frac{306\times657}{HCF} = \frac{306\times657}{9}$

LCM = 22338

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

Solution:

If any number has last digit 0,

Then, it should be divisible by 10

Factors of 10 = 2×5

So,

Value 6n should be divisible by 2 or 5

Prime factorisation of $6^n = (2\times3)^n$

Hence,

6n is divisible by 2 but not by 5.

It can not end with 0.

6. Explain why 7 × 11 × 13 + 13 and 7 × 6 × 5 × 4 × 3 × 2 × 1 + 5 are composite numbers.

Solution:

7×11×13+13

Taking 13 as common, we get,

13×(7×11+1) = 13×(77+1)

= 13×78

= 13×13×6

The given expression has 6 and 13 as its factors.

Therefore, it is a composite number.

7×6×5×4×3×2×1+5

Taking 5 as common , we get,

= 5×(7×6×4×3×2×1+1)

= 5× (1008+1)

= 5×1009

1009 cannot be factorised further.

Therefore, the given expression has 5 and 1009 as its factors.

Hence, it is a composite number.

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 LCM of both values at starting point.

18 = 2×3×3

And

12 = 2×2×3

LCM of 12 and 18 = 2×2×3×3 = 36

Therefore,

Ravi and Sonia will meet together at the starting point after 36 minutes.