Key Book

CAMBRIDGE SNC SERIES

Mathematics

Grade 6

Unit 1 Factors and Multiples

Exercise 1.1

1. Write all the factors of the following numbers.

(i) 72

Solution: To find factors of 72, we have to find all of its possible divisors.

$1 \times 72 = 72$
$2 \times 36 = 72$
$3 \times 24 = 72$
$4 \times 18 = 72$
$6 \times 12 = 72$
$8 \times 9 = 72$

Hence, the factors of 72 are 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36 and 72.

(ii) 60

Solution: To find factors of 60, we have to find all of its possible divisors.

$1 \times 60 = 60$
$2 \times 30 = 60$
$3 \times 20 = 60$
$4 \times 15 = 60$
$5 \times 12 = 60$
$6 \times 10 = 60$

Hence, the factors of 60 are 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30 and 60.

(iii) 32

Solution: To find factors of 32, we have to find all of its possible divisors.

$1 \times 32 = 32$
$2 \times 16 = 32$
$4 \times 8 = 32$

Hence, the factor of 32 are 1, 2, 4, 8, 16 and 32.

(iv) 120

Solution: To find factors of 120, we have to find all of its possible divisors.

$1 \times 120 = 120$
$2 \times 60 = 120$
$3 \times 40 = 120$
$4 \times 30 = 120$
$5 \times 24 = 120$
$6 \times 20 = 120$
$8 \times 15 = 120$
$10 \times 12 = 120$

Hence, the factors of 120 are 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60 and 120.

2. Write the first six multiples of the following numbers.

(i) 3

Solution: To find multiples of any given number, we have to multiply that number by natural numbers 1, 2, 3 and so on.

$3 \times 1 = 3$
$3 \times 2 = 6$
$3 \times 3 = 9$
$3 \times 4 = 12$
$3 \times 5 = 15$
$3 \times 6 = 18$

Hence, 3, 6, 9, 12, 15 and 18 are the first six multiples of 3.

(ii) 11

Solution: To find multiples of any given number, we have to multiply that number by natural numbers 1, 2, 3 and so on.

$11 \times 1 = 11$
$11 \times 2 = 22$
$11 \times 3 = 33$
$11 \times 4 = 44$
$11 \times 5 = 55$
$11 \times 6 = 66$

Hence, 11, 22, 33, 44, 55 and 66 are the first six multiples of 11.

(iii) 7

Solution: To find multiples of any given number, we have to multiply that number by natural numbers 1, 2, 3 and so on.

$7 \times 1 = 7$
$7 \times 2 = 14$
$7 \times 3 = 21$
$7 \times 4 = 28$
$7 \times 5 = 35$
$7 \times 6 = 42$

Hence, 7, 14, 21, 28, 35 and 42 are the first six multiples of 7.

(iv) 15

Solution: To find multiples of any given number, we have to multiply that number by natural numbers 1, 2, 3 and so on.

$15 \times 1 = 15$
$15 \times 2 = 30$
$15 \times 3 = 45$
$15 \times 4 = 60$
$15 \times 5 = 75$
$15 \times 6 = 90$

Hence, 15, 30, 45, 60, 75 and 90 are the first six multiples of 15.

3. Enlist the multiples of 6 between 30 and 100.

Solution: First five multiples of 6 are less than or equal to 30. So

$6 \times 6 = 36$
$6 \times 7 = 42$
$6 \times 8 = 48$
$6 \times 9 = 54$
$6 \times 10 = 60$
$6 \times 11 = 66$
$6 \times 12 = 72$
$6 \times 13 = 78$
$6 \times 14 = 84$
$6 \times 15 = 90$
$6 \times 16 = 96$

Hence, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90 and 96 are the multiples of 6 between 30 and 100.

4. Enlist the multiples of 4 between 10 and 50.

Solution: First two multiples of 4 are less than 10. So

$4 \times 3 = 12$
$4 \times 4 = 16$
$4 \times 5 = 20$
$4 \times 6 = 24$
$4 \times 7 = 28$
$4 \times 8 = 32$
$4 \times 9 = 36$
$4 \times 10 = 40$
$4 \times 11 = 44$
$4 \times 12 = 48$

Hence, 12, 16, 20, 24, 28, 32, 36, 40, 44 and 48 are the multiples of 4 between 10 and 50.

Exercise 1.2

1. Factorize the following into its prime factors using tree method and also express its factors in index notation.

(i) 128

Solution: Factorization of 128 using tree method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

$128 \div 2 = 64$

Step 2: Divide the given number by possible prime divisor until you get a prime number.

$64 \div 2 = 32$

$32 \div 2 = 16$

$16 \div 2 = 8$

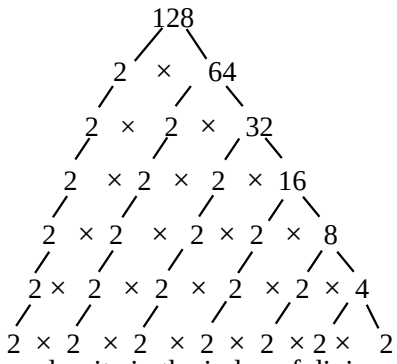
$8 \div 2 = 4$

$4 \div 2 = 2$

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of $128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

Factor Tree



To express in the index notation just count the number of similar divisors and write in the index of divisor.

Index Notation = 2^7

(ii) 1300

Solution: Factorization of 1300 using tree method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

$1300 \div 2 = 650$

Step 2: Divide the given number by possible prime divisor until you get a prime number.

$650 \div 2 = 325$

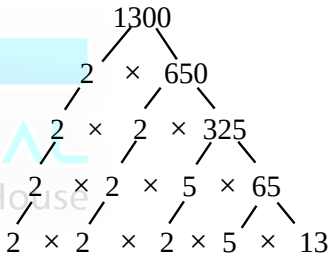
$325 \div 5 = 65$

$65 \div 5 = 13$

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of $1300 = 2 \times 2 \times 5 \times 5 \times 13$

Factor Tree



To express in the index notation just count the number of similar divisors and write in the index of divisor.

Index Notation = $2^2 \times 5^2 \times 13$

(iii) 360

Solution: Factorization of 360 using tree method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

$360 \div 2 = 180$

Step 2: Divide the given number by possible prime divisor until you get a prime number.

$180 \div 2 = 90$

$90 \div 2 = 45$

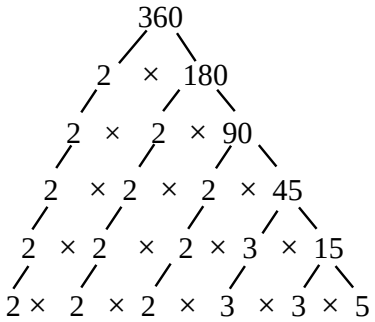
$45 \div 3 = 15$

$15 \div 3 = 5$

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of $360 = 2 \times 2 \times 2 \times 3 \times 3 \times 5$

Factor Tree



To express in the index notation just count the number of similar divisors and write in the index of divisor.

Index Notation = $2^3 \times 3^2 \times 5$

(iv) 500

Solution: Factorization of 500 using tree method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

500 ÷ 2 = 250

Step 2: Divide the given number by possible prime divisor until you get a prime number.

250 ÷ 2 = 125

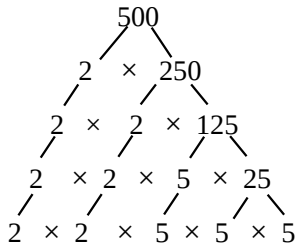
125 ÷ 5 = 25

25 ÷ 5 = 5

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of 500 = 2 × 2 × 5 × 5 × 5

Factor Tree



To express in the index notation just count the number of similar divisors and write in the index of divisor.

Index Notation = $2^2 \times 5^3$

(v) 252

Solution: Factorization of 252 using tree method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

252 ÷ 2 = 126

Step 2: Divide the given number by possible prime divisor until you get a prime number.

126 ÷ 2 = 63

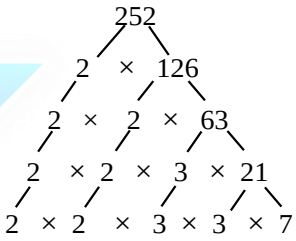
63 ÷ 3 = 21

21 ÷ 3 = 7

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of 252 = 2 × 2 × 3 × 3 × 7

Factor Tree



To express in the index notation just count the number of similar divisors and write in the index of divisor.

Index Notation = $2^2 \times 3^2 \times 7$

(vi) 650

Solution: Factorization of 650 using tree method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

650 ÷ 2 = 325

Step 2: Divide the given number by possible prime divisor until you get a prime number.

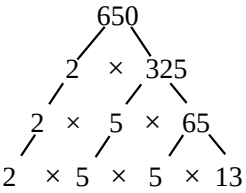
325 ÷ 5 = 65

65 ÷ 5 = 13

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of 650 = 2 × 5 × 5 × 13

Factor Tree



To express in the index notation just count the number of similar divisors and write in the index of divisor.

Index Notation = $2 \times 5^2 \times 13$

2. Factorize the following into its prime factors using division method and also express its factors in index notation.

(i) 605

Solution: Factorization of 605 using division method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

605 ÷ 5 = 121

5	605
11	121
	11

Step 2: Divide the quotient by least possible prime divisor until you get a prime number.

$121 \div 11 = 11$

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of $605 = 5 \times 11 \times 11$

To express in the index notation just count the number of similar divisors and write in the index of divisor.

Index Notation $= 5 \times 11^2$

(ii) 1089

Solution: Factorization of 1089 using division method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

$1089 \div 3 = 363$

Step 2: Divide the quotient by least possible prime divisor until you get a prime number.

$363 \div 3 = 121$

$121 \div 11 = 11$

3	1089
3	363
11	121
	11

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of $1089 = 3 \times 3 \times 11 \times 11$

To express in the index notation just count the number of similar divisors and write in the index of divisor.

Index Notation $= 3^2 \times 11^2$

(iii) 1575

Solution: Factorization of 1575 using division method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

$1575 \div 3 = 525$

Step 2: Divide the quotient by least possible prime divisor until you get a prime number.

$525 \div 3 = 175$

$175 \div 5 = 35$

$35 \div 5 = 7$

3	1575
3	525
5	175
5	35
	7

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of $1575 = 3 \times 3 \times 5 \times 5 \times 7$

To express in the index notation just count the number of similar divisors and write in the index of divisor.

Index Notation $= 3^2 \times 5^2 \times 7$

(iv) 1512

Solution: Factorization of 1512 using division method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

$1512 \div 2 = 756$

Step 2: Divide the quotient by least possible prime divisor until you get a prime number.

$756 \div 2 = 378$

$378 \div 2 = 189$

$189 \div 3 = 63$

$63 \div 3 = 21$

$21 \div 3 = 7$

2	1512
2	756
2	378
3	189
3	63
3	21
	7

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of $1512 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 7$

To express in the index notation just count the number of similar divisors and write in the index of divisor.
Index Notation = $2^3 \times 3^3 \times 7$

(v) 1650

Solution: Factorization of 1650 using division method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

1650 ÷ 2 = 825

Step 2: Divide the quotient by least possible prime divisor until you get a prime number.

825 ÷ 3 = 275

275 ÷ 5 = 55

55 ÷ 5 = 11

2	1650
3	825
5	275
5	55
	11

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of 1650 = $2 \times 3 \times 5 \times 5 \times 11$

To express in the index notation just count the number of similar divisors and write in the index of divisor.
Index Notation = $2 \times 3 \times 5^2 \times 11$

3. Find the square of the following numbers.

(i) 17

Solution: To find the square of 17 multiply it by itself.

Square of 17 = $(17)^2 = 17 \times 17$
$= 289$

Hence, the square of 17 is 289.

(ii) 35

Solution: To find the square of 35 multiply it by itself.

Square of 35 = $(35)^2 = 35 \times 35$
$= 1225$

Hence, the square of 35 is 1225.

(iii) 56

Solution: To find the square of 56 multiply it by itself.

Square of 56 = $(56)^2 = 56 \times 56$
$= 3136$

Hence, the square of 56 is 3136.

(iv) 40

Solution: To find the square of 40 multiply it by itself.

Square of 40 = $(40)^2 = 40 \times 40$
$= 1600$

Hence, the square of 40 is 1600.

(v) 23

Solution: To find the square of 23 multiply it by itself.

Square of 23 = $(23)^2 = 23 \times 23$
$= 529$

Hence, the square of 23 is 529.

Exercise 1.3

1. Find the "HCF" of following numbers using the common factor method.

(i) 18, 36

Solution: First of all, we have to find factors of 18 and 36.
Factors of 18 = 1, 2, 3, 6, 9, 18
Factors of 36 = 1, 2, 3, 4, 6, 9, 12, 18, 36
Now, find common factors (means that are same in both).
Common factors = 1, 2, 3, 6, 9, 18
Highest Common Factor = 18
Hence, the HCF of 18 and 36 is 18.

(ii) 21, 75

Solution: First of all, we have to find factors of 21 and 75.
Factors of 21 = 1, 3, 7, 21
Factors of 75 = 1, 3, 5, 15, 25, 75
Now, find common factors (means that are same in both).
Common factors = 1, 3
Highest Common Factor = 3
Hence, the HCF of 21 and 75 is 3.

(iii) 49, 14

Solution: First of all, we have to find factors of 49 and 14.
Factors of 49 = 1, 7, 49
Factors of 14 = 1, 2, 7, 14
Now, find common factors (means that are same in both).
Common factors = 1, 7
Highest Common Factor = 7
Hence, the HCF of 49 and 14 is 7.

(iv) 20, 30, 50

Solution: First of all, we have to find factors of 20, 30 and 50.
Factors of 20 = 1, 2, 4, 5, 10, 20
Factors of 30 = 1, 2, 3, 5, 6, 10, 15, 30
Factors of 50 = 1, 2, 5, 10, 25, 50
Now, find common factors (means that are same in all).
Common factors = 1, 2, 5, 10
Highest Common Factor = 10
Hence, the HCF of 20, 30 and 50 is 10.

(v) 33, 66, 44

Solution: First of all, we have to find factors of 33, 66 and 44.
Factors of 33 = 1, 3, 11, 33
Factors of 66 = 1, 2, 3, 6, 11, 22, 33, 66
Factors of 44 = 1, 2, 4, 11, 22, 44
Now, find common factors (means that are same in all).
Common factors = 1, 11
Highest Common Factor = 11
Hence, the HCF of 33, 66 and 44 is 11.

(vi) 39, 130, 52

Solution: First of all, we have to find factors of 39, 130 and 52.
Factors of 39 = 1, 3, 13, 39
Factors of 130 = 1, 2, 5, 10, 13, 26, 65, 130
Factors of 52 = 1, 2, 4, 13, 26, 52
Now, find common factors (means that are same in all).
Common factors = 1, 13
Highest Common Factor = 13
Hence, the HCF of 39, 130 and 52 is 13.

2. Find the "HCF" of following numbers using prime factorization method.

i) 24, 60

Solution: To find HCF of given numbers using prime factorization method:
Step 1: Find prime factorization of given numbers separately.
Prime factorization of 24 = 2 × 2 × 2 × 3
Prime factorization of 60 = 2 × 2 × 3 × 5
Step 2: Find all common prime factors.
Common prime factors are 2, 2 and 3.
Step 3: Multiply all prime factors.
So, HCF = 2 × 2 × 3 = 12
Hence, HCF of 24 and 60 is 12.

2	24
2	12
2	6
	3

2	60
2	30
3	15
	5

ii) 55, 99

Solution: To find HCF of given numbers using prime factorization method:
Step 1: Find prime factorization of given numbers separately.
Prime factorization of 55 = 5 × 11
Prime factorization of 99 = 3 × 3 × 11
Step 2: Find all common prime factors.
As common prime factor is only 11.
Hence, HCF of 55 and 99 is 11.

5	55
	11

3	99
3	33
	11

iii) 26, 46, 84

Solution: To find HCF of given numbers using prime factorization method:
Step 1: Find prime factorization of given numbers separately.
Prime factorization of 26 = 2 × 13
Prime factorization of 46 = 2 × 23
Prime factorization of 84 = 2 × 2 × 3 × 7
Step 2: Find all common prime factors.
As common prime factor is only 2.
Hence, HCF of 26, 46 and 84 is 2.

2	26
	13

2	46
	23

2	84
2	42
3	21
	7

iv) 94, 120, 136

Solution: To find HCF of given numbers using prime factorization method:
Step 1: Find prime factorization of given numbers separately.
Prime factorization of 94 = 2 × 47
Prime factorization of 120 = 2 × 2 × 2 × 3 × 5
Prime factorization of 136 = 2 × 2 × 2 × 17
Step 2: Find all common prime factors.
As common prime factor is only 2.
Hence, HCF of 94, 120 and 136 is 2.

2	94
	47

2	120
2	60
2	30
3	15
	5

2	136
2	68
2	34
	17

v) 60, 90, 120

Solution: To find HCF of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.

Prime factorization of 60 = 2 × 2 × 3 × 5

Prime factorization of 90 = 2 × 3 × 3 × 5

Prime factorization of 120 = 2 × 2 × 2 × 3 × 5

2	60
2	30
3	15
	5

2	90
3	45
3	15
	5

2	120
2	60
2	30
3	15
	5

Step 2: Find all common prime factors.

Common prime factors are 2, 3 and 5.

Step 3: Multiply all prime factors.

So, HCF = 2 × 3 × 5 = 30

Hence, HCF of 60, 90 and 120 is 30.

vi) 25, 50, 125

Solution: To find HCF of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.

Prime factorization of 25 = 5 × 5

Prime factorization of 50 = 2 × 5 × 5

Prime factorization of 125 = 5 × 5 × 5

5	25
	5

2	50
5	25
	5

5	125
5	25
	5

Step 2: Find all common prime factors.

Common prime factors are 5 and 5.

Step 3: Multiply all prime factors.

So, HCF = 5 × 5 = 25

Hence, HCF of 25, 50 and 125 is 25.

3. Find the "HCF" of the following numbers using long division method.

i) 22, 132

Solution: To find HCF of 22 and 132 using long division method:

Step 1: Find the greater and smaller number.

Step 2: Divide the greater number by the smaller number and get a remainder.

```
      6
22 | 132
    −132
      0
```

As remainder is '0' so the smaller number 22 is the HCF of 22 and 132.

ii) 405, 513

Solution: To find HCF of 405 and 513 using long division method:

Step 1: Find the greater and smaller number.

Step 2: Divide the greater number by the smaller number and get a remainder.

Step 3: As remainder is not zero, so divide the smaller number by the obtained divisor.

Step 4: Divide the previous divisor by obtained remainder. Repeat this process until the remainder is zero.

Step 5: Last divisor where remainder becomes zero is the HCF of given number.

```
        1          3          1          3
405 | 513 | −405 | 108 | 405 | −324 | 81 | 108 | −81 | 27 | 81 | −81 | 0
```

Hence, HCF of 405 and 513 is 27.

iii) 214, 224

Solution: To find HCF of 214 and 224 using long division method:

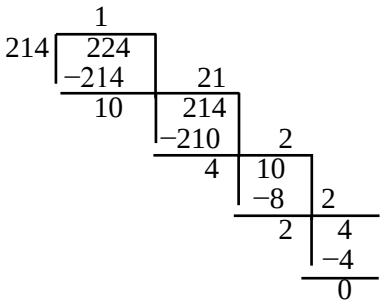
Step 1: Find the greater and smaller number.

Step 2: Divide the greater number by the smaller number and get a remainder.

Step 3: As remainder is not zero, so divide the smaller number by the obtained divisor.

Step 4: Remainder is again not zero. So, divide the previous divisor by obtained remainder. Repeat this process until the remainder is zero.

Step 5: Last divisor where remainder becomes zero is the HCF of given number.



Hence, HCF of 214 and 224 is 2.

iv) 24, 28, 44

Solution: To find HCF of 24, 28 and 44 using long division method:

Step 1: In case of three numbers you can choose any pair of numbers and find the greater number.

Step 2: Divide the greater number by the smaller number and get a remainder.

Step 3: As remainder is not zero, so divide the smaller number by the obtained divisor.

Step 4: Here 4 is the last divisor. Now divide the remaining number 44 by the last divisor 4.

Hence, HCF of 24, 28 and 44 is 4.

Exercise 1.4

1. Find the "LCM" of the following numbers by common multiple method.

(i) 5, 8

Solution: Using common multiple method to find LCM of 5 and 8:

Step 1: Find at least first ten multiples of given numbers.

Multiples of 5 = 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, …

Multiples of 8 = 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, …

Step 2: Find the first common multiple.

Here 40 is the first common multiple so it is the least one.

Hence, 40 is the LCM of 5 and 8.

(ii) 10, 20

Solution: Using common multiple method to find LCM of 10 and 20:

Step 1: Find at least first ten multiples of given numbers.

Multiples of 10 = 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, …

Multiples of 20 = 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, …

Step 2: Find the first common multiple.

Here 20 is the first common multiple so it is the least one.
Hence, 20 is the LCM of 10 and 20.

(iii) 25, 15

Solution: Using common multiple method to find LCM of 25 and 15:
Step 1: Find at least first ten multiples of given numbers.
Multiples of 25 = 25, 50, 75, 100, 125, 150, 175, 200, 225, 250, …
Multiples of 15 = 15, 30, 45, 60, 75, 90, 105, 120, 135, 150, …
Step 2: Find the first common multiple.
Here 75 is the first common multiple so it is the least one.
Hence, 75 is the LCM of 25 and 15.

(iv) 4, 6, 8

Solution: Using common multiple method to find LCM of 4, 6 and 8:
Step 1: Find at least first ten multiples of given numbers.
Multiples of 4 = 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, …
Multiples of 6 = 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, …
Multiples of 8 = 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, …
Step 2: Find the first common multiple.
Here 24 is the first common multiple so it is the least one.
Hence, 24 is the LCM of 4, 6 and 8.

(v) 6, 9, 12

Solution: Using common multiple method to find LCM of 6, 9 and 12:
Step 1: Find at least first ten multiples of given numbers.
Multiples of 6 = 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, …
Multiples of 9 = 9, 18, 27, 36, 45, 54, 63, 72, 81, 90, …
Multiples of 12 = 12, 24, 36, 48, 60, 72, 84, 96, 108, 120, …
Step 2: Find the first common multiple.
Here 36 is the first common multiple so it is the least one.
Hence, 36 is the LCM of 6, 9 and 12.

(vi) 5, 10, 15

Solution: Using common multiple method to find LCM of 5, 10 and 15:
Step 1: Find at least first ten multiples of given numbers.
Multiples of 5 = 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, …
Multiples of 10 = 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, …
Multiples of 15 = 15, 30, 45, 60, 75, 90, 105, 120, 135, 150, …
Step 2: Find the first common multiple.
Here 30 is the first common multiple so it is the least one.
Hence, 30 is the LCM of 5, 10 and 15.

2. Find the "LCM" of the following numbers by prime factorization method.

(i) 28, 60

Solution: To find LCM of given numbers using prime factorization method:
Step 1: Find prime factorization of given numbers separately.
Prime factorization of 28 = 2 × 2 × 7
Prime factorization of 60 = 2 × 2 × 3 × 5
Step 2: Find all common and non-common prime factors.
Common prime factors are 2 and 2.

2	28
2	14
	7

2	60
2	30
3	15
	5

Non-common prime factors are 7, 3 and 5.

Step 3: Multiply all common and non-common prime factors using the formula

LCM = (Common prime factors) × (Non-common prime factors)

= (2 × 2) × (7 × 3 × 5)

= 4 × 105 = 420

Hence, LCM of 28 and 60 is 420.

(ii) 22, 44

Solution: To find LCM of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.

Prime factorization of 22 = 2 × 11

Prime factorization of 44 = 2 × 2 × 11

2	22
	11

2	44
2	22
	11

Step 2: Find all common and non-common prime factors.

Common prime factors are 2 and 11.

Non-common prime factor is only 2.

Step 3: Multiply all common and non-common prime factors using the formula

LCM = (Common prime factors) × (Non-common prime factors)

= (2 × 11) × (2)

= 22 × 2 = 44

Hence, LCM of 22 and 44 is 44.

(iii) 50, 75, 90

Solution: To find LCM of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.

Prime factorization of 50 = 2 × 5 × 5

Prime factorization of 75 = 3 × 5 × 5

Prime factorization of 90 = 2 × 3 × 3 × 5

2	50
5	25
	5

3	75
5	25
	5

2	90
3	45
3	15
	5

Step 2: Find all common and non-common prime factors.

Common prime factors are 2, 3, 5 and 5.

Non-common prime factor is only 3.

Step 3: Multiply all common and non-common prime factors using the formula

LCM = (Common prime factors) × (Non-common prime factors)

= (2 × 3 × 5 × 5) × (3)

= 150 × 3

= 450

Hence, LCM of 50, 75 and 90 is 450.

(iv) 112, 120, 98

Solution: To find LCM of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.

Prime factorization of 112 = 2 × 2 × 2 × 2 × 7

Prime factorization of 120 = 2 × 2 × 2 × 3 × 5

Prime factorization of 98 = 2 × 7 × 7

2	112
2	56
2	28
2	14
	7

2	120
2	60
2	30
3	15
	5

2	98
7	49
	7

Step 2: Find all common and non-common prime factors.

Common prime factors are 2, 2, 2 and 7.

Non-common prime factors are 2, 3, 5 and 7.

Step 3: Multiply all common and non-common prime factors using the formula

LCM = (Common prime factors) × (Non-common prime factors)

= (2 × 2 × 2 × 7) × (2 × 3 × 5 × 7)

= 56 × 210

= 11,760

Hence, LCM of 112, 120 and 98 is 11,760.

(v) 125, 150, 100

Solution: To find LCM of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.

Prime factorization of 125 = 5 × 5 × 5

Prime factorization of 150 = 2 × 3 × 5 × 5

Prime factorization of 100 = 2 × 2 × 5 × 5

5	125
5	25
	5

2	150
3	75
5	25
	5

2	100
2	50
5	25
	5

Step 2: Find all common and non-common prime factors.

Common prime factors are 2, 5 and 5.

Non-common prime factors are 5, 3 and 2.

Step 3: Multiply all common and non-common prime factors using the formula

LCM = (Common prime factors) × (Non-common prime factors)

= (2 × 5 × 5) × (5 × 3 × 2)

= 50 × 30

= 1,500

Hence, LCM of 125, 150 and 100 is 1,500.

(vi) 60, 80, 120

Solution: To find LCM of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.

Prime factorization of 60 = 2 × 2 × 3 × 5

Prime factorization of 80 = 2 × 2 × 2 × 2 × 5

Prime factorization of 120 = 2 × 2 × 2 × 3 × 5

2	60
2	30
3	15
	5

2	80
2	40
2	20
2	10
	5

2	120
2	60
2	30
3	15
	5

Step 2: Find all common and non-common prime factors.

Common prime factors are 2, 2, 2, 3 and 5.

Non-common prime factor is only 2.

Step 3: Multiply all common and non-common prime factors using the formula

LCM = (Common prime factors) × (Non-common prime factors)

= (2 × 2 × 2 × 3 × 5) × (2)

= 120 × 2

= 240

Hence, LCM of 60, 80 and 120 is 240.

3. Find the "LCM" of the following numbers by division method.

(i) 70, 140

Solution: To find LCM of given numbers using division method:

Step 1: Arrange all the numbers in a row.

Step 2: Write the common factors which divides at least one number.

Step 3: If a number is not divided by a common factor, bring it down and divide it separately.

Step 4: Continue the process until we get the quotient 1, 1.

Step 5: Multiply all the divisors to get LCM.

2	70, 140
2	35, 70
5	35, 35
7	7, 7
	1, 1

LCM = 2 × 2 × 5 × 7

= 140

Hence, LCM of 70 and 140 is 140.

(ii) 36, 48, 60

Solution: To find LCM of given numbers using division method:

Step 1: Arrange all the numbers in a row.
Step 2: Write the common factors which divides at least one number.
Step 3: If a number is not divided by a common factor, bring it down and divide it separately.
Step 4: Continue the process until we get the quotient 1, 1, 1.
Step 5: Multiply all the divisors to get LCM.

LCM = 2 × 2 × 2 × 2 × 3 × 3 × 5
= 720

Hence, LCM of 36, 48 and 60 is 720.

2	36, 48, 60
2	18, 24, 30
2	9, 12, 15
2	9, 6, 15
3	9, 3, 15
3	3, 1, 5
5	1, 1, 5
	1, 1, 1

(iii) 150, 200, 250

Solution: To find LCM of given numbers using division method:

Step 1: Arrange all the numbers in a row.
Step 2: Write the common factors which divides at least one number.
Step 3: If a number is not divided by a common factor, bring it down and divide it separately.
Step 4: Continue the process until we get the quotient 1, 1, 1.
Step 5: Multiply all the divisors to get LCM.

LCM = 2 × 2 × 2 × 5 × 5 × 5 × 3
= 3,000

Hence, LCM of 150, 200 and 250 is 3,000.

2	150, 200, 250
2	75, 100, 125
2	75, 50, 125
5	75, 25, 125
5	15, 5, 25
5	3, 1, 5
3	3, 1, 1
	1, 1, 1

(iv) 27, 36, 56

Solution: To find LCM of given numbers using division method:

Step 1: Arrange all the numbers in a row.
Step 2: Write the common factors which divides at least one number.
Step 3: If a number is not divided by a common factor, bring it down and divide it separately.
Step 4: Continue the process until we get the quotient 1, 1, 1.
Step 5: Multiply all the divisors to get LCM.

LCM = 2 × 2 × 2 × 3 × 3 × 3 × 7
= 1,512

Hence, LCM of 27, 36 and 56 is 1,512.

2	27, 36, 56
2	27, 18, 28
2	27, 9, 14
3	27, 9, 7
3	9, 3, 7
3	3, 1, 7
7	1, 1, 7
	1, 1, 1

(v) 75, 100, 125

Solution: To find LCM of given numbers using division method:

Step 1: Arrange all the numbers in a row.
Step 2: Write the common factors which divides at least one number.
Step 3: If a number is not divided by a common factor, bring it down and divide it separately.
Step 4: Continue the process until we get the quotient 1, 1, 1.
Step 5: Multiply all the divisors to get LCM.

LCM = 2 × 2 × 5 × 5 × 5 × 3
= 1,500

Hence, LCM of 75, 100 and 125 is 1,500.

2	75, 100, 125
2	75, 50, 125
5	75, 25, 125
5	15, 5, 25
5	3, 1, 5
3	3, 1, 1
	1, 1, 1

(vi) 12, 18, 22, 26

Solution: To find LCM of given numbers using division method:

Step 1: Arrange all the numbers in a row.
Step 2: Write the common factors which divides at least one number.
Step 3: If a number is not divided by a common factor, bring it down and divide it separately.
Step 4: Continue the process until we get the quotient 1, 1, 1, 1.
Step 5: Multiply all the divisors to get LCM.

2	12, 18, 22, 26
2	6, 9, 11, 13
3	3, 9, 11, 13
3	1, 3, 11, 13
11	1, 1, 11, 13
13	1, 1, 1, 13
	1, 1, 1, 1

LCM = 2 × 2 × 3 × 3 × 11 × 13
= 5,148
Hence, LCM of 12, 18, 22 and 26 is 5,148.

Exercise 1.5

1. Find the greatest numbers that can divide the numbers 18, 27 and 45 exactly.

Solution: Here we want to find the greatest divisor that can divide 18, 27 and 45 exactly. So, we will find HCF of 18, 27 and 45.

```
        1
18 ) 27
    −18 | 2
     9  | 18
        | −18
        |  0
```

```
        5
9 ) 45
   −45
    0
```

Remember
Changing the method of finding HCF of numbers did not affect on the answer. You can choose any method to find HCF.

Hence, 9 is the greatest number that can divide 18, 27 and 45 exactly.

2. Find the smallest numbers which is divisible by 25, 35, 45 and 60.

Solution: We want to find the smallest dividend which is divisible by 25, 35, 45 and 60. Here we will use LCM because of the keyword 'smallest'.
Now find LCM of 25, 35, 45 and 60

5	25, 35, 45, 60
5	5, 7, 9, 12
3	1, 7, 9, 12
3	1, 7, 3, 4
7	1, 7, 1, 4
2	1, 1, 1, 4
2	1, 1, 1, 2
	1, 1, 1, 1

LCM = 5 × 5 × 7 × 3 × 3 × 2 × 2
= 6,300

As, 6,300 is the LCM of 25, 35, 45 and 60 so 6,300 is the smallest number which is divisible by 25, 35, 45 and 60.

3. Find the smallest length of a ruler that can be cut exactly pieces of length 45 cm, 65 cm, and 90 cm.

Solution: To find the smallest length of a ruler that can be cut exactly pieces of length 45 cm, 65 cm, and 90 cm we will use LCM because of the keyword 'smallest'.

Now find LCM of 45, 65 and 90

2	45, 65, 90
3	45, 65, 45
3	15, 65, 15
5	5, 65, 5
13	1, 13, 1
	1, 1, 1

LCM = 2 × 3 × 3 × 5 × 13

= 1,170

Hence, the smallest length of a ruler that can be cut exactly pieces of length 45 cm, 65 cm, and 90 cm is 1,170 cm.

Remember
Changing the method of finding LCM of numbers did not effect on the answer. You can choose any method to find LCM.

4. **One wheel rotates once every 12 minutes, second wheel rotates once every 15 minutes and third wheel rotates once every 10 minutes. When will they rotate at the same time?**

Solution:

First wheel rotates once every 12 minutes.
Second wheel rotates once every 15 minutes.
Third wheel rotates once every 10 minutes.

Here we will calculate LCM of 12, 15 and 10.

Prime factorization of 12 = 2 × 2 × 3
Prime factorization of 15 = 3 × 5
Prime factorization of 10 = 2 × 5

2	12
2	6
	3

3	15
	5

2	10
	5

Common prime factors are 2, 3 and 5.
Non-common prime factor is only 2.
Multiply all common and non-common prime factors using the formula
LCM = (Common prime factors) × (Non-common prime factors)
= (2 × 3 × 5) × (2)
= 30 × 2
= 60

Hence, LCM of 12, 15 and 10 is 60 it means after 60 minutes they will rotate at the same time.

5. **Three lights blink after every 8 seconds, 16, seconds and 24 seconds respectively. If they blink together at 7:30 PM, at what time will they blink again altogether?**

Solution: To solve this problem we will use LCM.
So, calculate LCM of 8, 16 and 24.

2	8, 16, 24
2	4, 8, 12
2	2, 4, 6
2	1, 2, 3
3	1, 1, 3
	1, 1, 1

LCM = 2 × 2 × 2 × 2 × 3

= 48

Hence, LCM of 8, 16 and 24 is 48 it means after 48 seconds they will blink altogether at 07:30:48 PM.

6. **There are 150, 160 and 120 students in three classes respectively, Find the maximum number of students who can sit in a row if each row contains an equal number of students.**

Solution: Number of students in three classes are 150, 160 and 120 students respectively.
Here, the keyword 'maximum' shows we will use HCF to solve this problem.
Now, calculate HCF of 150, 160 and 120.
Prime factorization of 150 = 2 × 3 × 5 × 5

2	150

2	160

2	120

Prime factorization of 160 = 2 × 2 × 2 × 2 × 2 × 5
Prime factorization of 120 = 2 × 2 × 2 × 3 × 5
Common prime factors are 2 and 5.
Multiply all prime factors.
So, HCF = 2 × 5
= 10

3	75
5	25
	5

2	80
2	40
2	20
2	10
	5

2	60
2	30
3	15
	5

Hence, HCF of 150, 160 and 120 is 10 it means maximum number of students in a row is 10 students.

7. Find the greatest length of a measure of iron wire which can be used to measure exactly, 300 cm, 250 cm and 130 cm.

Solution: Here, the keyword 'greatest' shows we will use HCF to solve this problem.
Now, calculate HCF of 300, 250 and 130.

```
        1
250 | 300
    −250 | 5
      50 | 250
         −250
           0
```

```
        2
50  | 130
    −100 | 1
      30 | 50
         −30 | 1
           20 | 30
              −20 | 2
                10 | 20
                   −20
                    0
```

Hence, HCF of 300, 250 and 130 is 10 it means greatest length of iron wire which can be used to measure exactly 300 cm, 250 cm and 130 cm is 10 cm.

8. What is the minimum capacity of a tanker that can be filled by the tanker of capacity 15 L, 20 L and 30 L?

Solution: Here, the keyword 'minimum' shows we will use LCM to solve this problem.
Now, calculate LCM of 15, 20 and 30.

2	15, 20, 30
2	15, 10, 15
3	15, 5, 15
5	5, 5, 5
	1, 1, 1

LCM = 2 × 2 × 3 × 5

= 60

Hence, LCM of 15, 20 and 30 is 60 it means the minimum capacity of a tanker that can be filled by the tanker of capacity 15 L, 20 L and 30 L is 60 L.

9. The HCF and LCM of two numbers are 15 and 60 respectively. If the first number is 45, find the second number.

Solution: Given that HCF = 15, LCM = 60 and first number = 45
Let x be the second number.
Relation between HCF and LCM of two numbers is:
HCF × LCM = Product of two numbers
$15 \times 60 = 45 \times x$
$900 = 45 \times x$

$900 \div 45 = x$

$20 = x$

Hence, the second number is 20.

10. The product of two numbers is 13200. If the HCF is 25, then find the LCM of that numbers.

Solution:

Given that,

Product of two numbers = 13200, HCF = 25, LCM = ?

Let x be the LCM.

Relation between HCF and LCM of two numbers is:

HCF × LCM = Product of two numbers

$25 \times x = 13200$

$x = 13200 \div 25$

$x = 528$

Hence, LCM of those numbers is 528.

Review Exercise 1

1. Choose the correct option.

(i) Multiple is the product of two:

(a) even numbers (b) odd numbers

(c) factors (d) composite numbers

(ii) Every number is a factor of:

(a) each other (b) itself

(c) even number (d) odd number

(iii) Prime number whose difference is "2" is called:

(a) composite number (b) twin prime numbers

(c) co-prime numbers (d) even numbers

(iv) The process of writing a number into its prime factor is called:

(a) LCM (b) prime factorization

(c) HCF (d) index notation

(v) HCF is also known as:

(a) highest common finite (b) least common multiples

(c) highest composite factor (d) greatest common divisor

(vi) Which number is neither prime number nor composite number?

(a) 1 (b) 2

(c) 0 (d) 3

(vii) Prime numbers between 13 and 20 are:

(a) 13, 15, 17, 19 (b) 15, 17, 19

(c) 17, 19 (d) 15, 17, 19, 20

(viii) LCM × HCF = ?

(a) Addition at two numbers (b) Product of two numbers

(c) Subtraction of two number (d) Division of two number

2. Factorize the following into prime factors using division method:

(i) 650

Solution: Factorization of 650 using division method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

650 ÷ 2 = 325

Step 2: Divide the quotient by least possible prime divisor until you get a prime number.

325 ÷ 5 = 65

65 ÷ 5 = 13

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of 650 = 2 × 5 × 5 × 13

2	650
5	325
5	65
	13

(ii) 890

Solution: Factorization of 890 using division method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

890 ÷ 2 = 445

Step 2: Divide the quotient by least possible prime divisor until you get a prime number.

445 ÷ 5 = 89

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of 890 = 2 × 5 × 89

2	890
5	445
	89

(iii) 1250

Solution: Factorization of 1250 using division method is:

Step 1: Strat factoring the given number by least possible prime divisor (factor).

1250 ÷ 2 = 625

Step 2: Divide the quotient by least possible prime divisor until you get a prime number.

625 ÷ 5 = 125

125 ÷ 5 = 25

25 ÷ 5 = 5

Step 3: Multiply all obtained prime divisors at the end.

Prime factorization of 1250 = 2 × 5 × 5 × 5 × 5

2	1250
5	625
5	125
5	25
	5

3. Find the HCF by using prime factorization method.

(i) 77, 99

Solution: To find HCF of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.

Prime factorization of 77 = 7 × 11

Prime factorization of 99 = 3 × 3 × 11

Step 2: Find all common prime factors.

As common prime factor is only 11.

Hence, HCF of 77 and 99 is 11.

7	77
	11

3	99
3	33
	11

(ii) 18, 46, 86

Solution: To find HCF of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.

Prime factorization of 18 = 2 × 3 × 3

Prime factorization of 46 = 2 × 23

Prime factorization of 86 = 2 × 43

Step 2: Find all common prime factors.

As common prime factor is only 2.

2	18
3	9
	3

2	46
	23

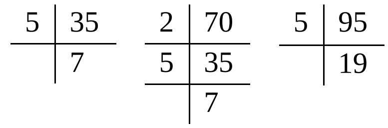
2	86
	43

Hence, HCF of 18, 46 and 86 is 2.

(iii) 35, 70, 95

Solution: To find HCF of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.



Prime factorization of 35 = 5 × 7
Prime factorization of 70 = 2 × 5 × 7
Prime factorization of 95 = 5 × 19

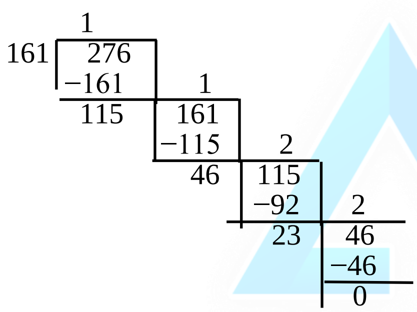
Step 2: Find all common prime factors.
As common prime factor is only 5.
Hence, HCF of 35, 70 and 95 is 5.

4. Find the HCF by using long division method.

(i) 276, 161

Solution: To find HCF of 276 and 161 using long division method:

Step 1: Find the greater and smaller number.
Step 2: Divide the greater number by the smaller number and get a remainder.
Step 3: If the remainder is not zero, so divide the smaller number by the obtained divisor.
Step 4: Divide the previous divisor by obtained remainder. Repeat this process until the remainder is zero.
Step 5: Last divisor where remainder becomes zero is the HCF of the given numbers.

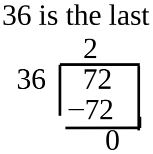


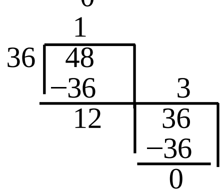
Hence, HCF of 276 and 161 is 23.

(ii) 36, 72, 48

To find HCF of 36, 72 and 48 using long division method:

Step 1: In case of three numbers you can choose any pair of numbers and find the greater number.
Step 2: Divide the greater number by the smaller number and get a remainder.
Step 3: Here 36 is the last divisor. Now divide the remaining number 48 by the last divisor 36.





Hence, HCF of 36, 72 and 48 is 12.

(iii) 330, 550, 770

To find HCF of 330, 550 and 770 using long division method:

Step 1: In case of three numbers you can choose any pair of numbers and find the greater number.

Step 2: Divide the greater number by the smaller number and get a remainder.
Step 3: If remainder is not zero, so divide the smaller number by the obtained divisor.
Step 4: Here 110 is the last divisor. Now divide the remaining number 770 by the last divisor 110.
Step 5: Last divisor where remainder becomes zero is the HCF of the given numbers.

```
          1
330 ) 550 ( 1
      −330
      ----
        220 ) 330 ( 2
              −220
              ----
              110 ) 220 ( 2
                    −220
                    ----
                      0
```

```
          7
110 ) 770 ( 7
      −770
      ----
        0
```

Hence, HCF of 330, 550 and 770 is 110.

5. Find the LCM by using prime factorization method.

(i) 44, 88

Solution: To find LCM of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.
Prime factorization of 44 = 2 × 2 × 11
Prime factorization of 88 = 2 × 2 × 2 × 11

2	44
2	22
	11

2	88
2	44
2	22
	11

Step 2: Find all common and non-common prime factors.
Common prime factors are 2, 2 and 11.
Non-common prime factor is only 2.
Step 3: Multiply all common and non-common prime factors using the formula
LCM = (Common prime factors) × (Non-common prime factors)
= (2 × 2 × 11) × (2)
= 44 × 2
= 88
Hence, LCM of 44 and 88 is 88.

(ii) 144, 180, 350

Solution: To find LCM of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.
Prime factorization of 144 = 2 × 2 × 2 × 2 × 3 × 3
Prime factorization of 180 = 2 × 2 × 3 × 3 × 5
Prime factorization of 350 = 2 × 5 × 5 × 7

2	144
2	72
2	36
2	18
3	9
	3

2	180
2	90
3	45
3	15
	5

2	350
5	175
5	35
	7

Step 2: Find all common and non-common prime factors.
Common prime factors are 2, 2, 3, 3 and 5.
Non-common prime factors are 2, 2, 5 and 7.
Step 3: Multiply all common and non-common prime factors using the formula
LCM = (Common prime factors) × (Non-common prime factors)
= (2 × 2 × 3 × 3 × 5) × (2 × 2 × 5 × 7)
= 180 × 140
= 25,200
Hence, LCM of 144, 180 and 350 is 25,200.

(iii) 150, 200, 250

Solution: To find LCM of given numbers using prime factorization method:

Step 1: Find prime factorization of given numbers separately.

2	150
3	75
5	25
	5

2	200
2	100
2	50
5	25
	5

2	250
5	125
5	25
	5

Prime factorization of 150 = 2 × 3 × 5 × 5
Prime factorization of 200 = 2 × 2 × 2 × 5 × 5
Prime factorization of 250 = 2 × 5 × 5 × 5
Step 2: Find all common and non-common prime factors.
Common prime factors are 2, 5 and 5.
Non-common prime factors are 3, 2, 2 and 5.
Step 3: Multiply all common and non-common prime factors using the formula
LCM = (Common prime factors) × (Non-common prime factors)
= (2 × 5 × 5) × (3 × 2 × 2 × 5)
= 50 × 60 = 3,000
Hence, LCM of 150, 200 and 250 is 3,000.

6. Find the LCM of the following by using division method:

(i) 27, 36, 45

Solution: To find LCM of given numbers using division method:
Step 1: Arrange all the numbers in a row.
Step 2: Write the common factors which divides at least one number.
Step 3: If a number is not divided by a common factor, bring it down and divide it separately.
Step 4: Continue the process until we get the quotient 1, 1, 1.
Step 5: Multiply all the divisors to get LCM.

2	27, 36, 45
2	27, 18, 45
3	27, 9, 45
3	9, 3, 15
3	3, 1, 5
5	1, 1, 5
	1, 1, 1

LCM = 2 × 2 × 3 × 3 × 3 × 5
= 540
Hence, LCM of 27, 36 and 45 is 540.

(ii) 140, 210, 315

Solution: To find LCM of given numbers using division method:
Step 1: Arrange all the numbers in a row.
Step 2: Write the common factors which divides at least one number.
Step 3: If a number is not divided by a common factor, bring it down and divide it separately.
Step 4: Continue the process until we get the quotient 1, 1, 1.
Step 5: Multiply all the divisors to get LCM.

2	140, 210, 315
2	70, 105, 315
3	35, 105, 315
3	35, 35, 105
5	35, 35, 35
7	7, 7, 7
	1, 1, 1

LCM = 2 × 2 × 3 × 3 × 5 × 7
= 1,260
Hence, LCM of 140, 210 and 315 is 1,260.

(iii) 150, 180, 120

Solution: To find LCM of given numbers using division method:
Step 1: Arrange all the numbers in a row.
Step 2: Write the common factors which divides at least one number.
Step 3: If a number is not divided by a common factor, bring it down and divide it separately.
Step 4: Continue the process until we get the quotient 1, 1, 1.
Step 5: Multiply all the divisors to get LCM.

2	150, 180, 120
2	75, 90, 60
2	75, 45, 30
3	75, 45, 15
3	25, 15, 5
5	25, 5, 5
5	5, 1, 1
	1, 1, 1

LCM = 2 × 2 × 2 × 3 × 3 × 5 × 5
= 1,800
Hence, LCM of 150, 180 and 120 is 1,800.

7. The HCF of two numbers 200, 150 is 50. Find their LCM.

Solution: Given numbers are 200 and 150, we have to find their LCM.

2	200, 150
2	100, 75
2	50, 75
3	25, 75
5	25, 25
5	5, 5
	1, 1

LCM = 2 × 2 × 2 × 3 × 5 × 5

= 600

Hence, LCM of 200 and 150 is 600.

8. There are 150, 200, 250 oranges on trees. What is the largest group into which the oranges can be split if they are arranged equally?

Solution: Number of oranges on trees are 150, 200 and 250.

Here, the keyword 'largest' shows we will use HCF to solve this problem.

Now, calculate HCF of 150, 200 and 250.

Prime factorization of 150 = 2 × 3 × 5 × 5

Prime factorization of 200 = 2 × 2 × 2 × 5 × 5

Prime factorization of 250 = 2 × 5 × 5 × 5

Common prime factors are 2, 5 and 5.

Multiply all prime factors.

So, HCF = 2 × 5 × 5

= 50

2	150
3	75
5	25
	5

2	200
2	100
2	50
5	25
	5

2	250
5	125
5	25
	5

Hence, HCF of 150, 200 and 250 is 50. It means largest group of oranges is 50 oranges.

9. Three light houses flash light every 10 seconds, 16 seconds and 18 seconds respectively. At what time they next flash together?

Solution: Here, we will use LCM to solve this problem.

Now find LCM of 10, 16 and 18.

2	10, 16, 18
2	5, 8, 9
2	5, 4, 9
2	5, 2, 9
3	5, 1, 9
3	5, 1, 3
5	5, 1, 1
	1, 1, 1

LCM = 2 × 2 × 2 × 2 × 3 × 3 × 5

= 720

Hence, after 720 seconds they next flash together.