NCERT Solutions Class 6 Maths (Ganita Prakash)

Chapter 5 Prime Time

Figure it Out (Page No. 108)

Question 1. At what number is 'idli-vada' said for the 10th time?

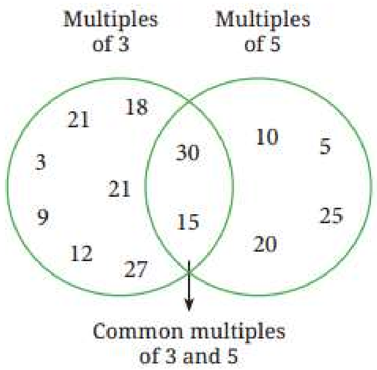
Solution: To determine the 10th occurrence of "idli- vada"; we need to identify the numbers that are multiples of both 3 and 5.
The numbers for which "idli-vada" is said are the multiples of 15.
This sequence is: 15,30,45,60, 75,90, 105, 120,135,150,...
Thus, the 10th number for which players should say "idli-vada" is 150.

Question 2.
If the game is played for the numbers from 1 to 90, find out: (Medium)
(a) How many times would the children say 'idli' (including the times they say 'idli-vada')?
(b) How many times would the children say 'vada' (including the times they say 'idli-vada')?
(c) How many times would the children say 'idli-vada'?

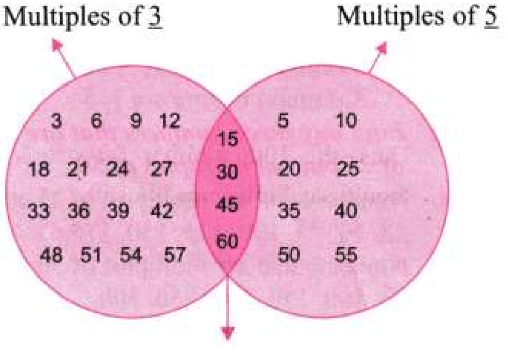
Solution: (a) 30 times would the children say 'idli' (including the times they say 'idli-vada') because, between 1 to 90, there are 30 numbers that are multiple of 3.
3, 6, 9, 12, 15, 18, 21,........
(b) 18 times would the children say 'vada' (including the times they say 'idli-vada') because, between 1 to 90, there are 18 numbers which are multiple of 5.
5, 10, 15, 20, 25, 30,..........
(c) 6 times would the children say 'idli-vada'.
15, 30, 45, 60, 75, 90.

Question 3. What if the game was played till 900? How would your answers change?

Solution: Number of multiples of 3 from 1 till 900 = 9003 = 300
Number of multiples of 5 from 1 till 900 = 9005 = 180
Number of multiples of 15 from 1 till 900 = 90015 = 60
Question 4.
Is this figure somehow related to the 'idli- vada' game? (Hint: Imagine playing the game till 30. Draw the figure if the game is played till 60.)



Solution: Yes, this figure is related to the 'idli-vada' game. Figure below for game played till 60.



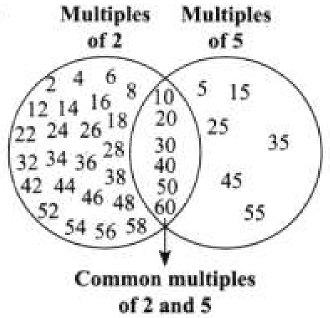
Intext Questions

Question 1.
Let us now play the 'idli-vada' game with different pairs of numbers: (Page 108)

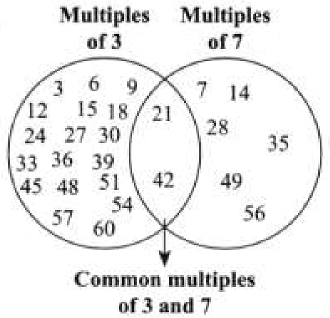
(a) 2 and 5,
(b) 3 and 7,
(c) 4 and 6.
We will say 'idli' for multiples … game is played up to 60.

Solution:

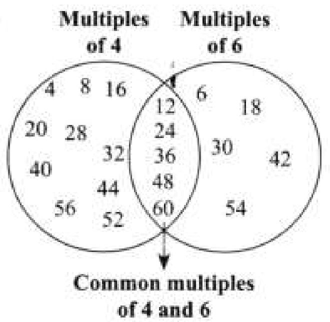
(a)



(b)



(c)



Question 2. Which of the following could be the other number: 2,3, 5, 8, 10? (Page 109)

Solution: As one of the numbers was 4. Among the given numbers, every multiple of 8 is also a multiple of 4. So, the other number is 8.

Question 3. What jump size can reach both 15 and 30? There are multiple jump sizes possible. Try to find them all. (Page 110)

Solution: Factors of 15 are 1, 3, 5 and 15
Factors of 30 are 1, 2, 3, 5, 6, 10, 15 and 30
The jump size that reach both 15 and 30 are 1, 3, 5 and 15, the common factors of 15 and 30.

Question 4. Look at the table below. What do you notice?

31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

In the table,
1. Is there anything common among the shaded numbers?
Solution: The shaded numbers are the multiples of 3 starting from 33.

2. Is there anything common among the circled numbers?
Solution: The circled numbers are the multiples of 4 starting from 32.

3. Which numbers are both shaded and circled? What are these numbers called?
Solution: Numbers 36,48 and 60 are both shaded and circled. These numbers are called common multiples of 3 and 4.

Figure it Out (Page No. 110 – 111)

Question 1. Find all multiples of 40 that lie between 310 and 410.

Solution: The numbers which are multiple of 40 lying between 310 and 410 are 320, 360, and 400.

Question 2. Who am I?
(a) I am a number less than 40. One of my factors is 7. The sum of my digits is 8.
(b) I am a number less than 100. Two of my factors are 3 and 5. One of my digits is 1 more than the other.

Solution: (a) 35 is a number less than 40. One of the factors is 7 and the sum of the digits is 8.
(b) If the factors are 3 and 5 it has to be a multiple of 15 which are 15, 30, 45, 60, 75, and 90.
By the given condition of the digit is 1 more than the other is only 45.
So, 45 is a number that follows all the conditions.

Question 3. A number for which the sum of all its factors is equal to twice the number is called a perfect number. The number 28 is a perfect number. Its factors are 1, 2, 4, 7, 14 and 28. Their sum is 56 which is twice 28. Find a perfect number between 1 and 10.

Solution: Factors of 6 are 1,2 and 3.
$\Rightarrow 1 + 2 + 3 + 6 = 12$
Since, $12 = 2 \times 6$
$\therefore$ Sum of factors is equal to twice the number.
Thus, 6 is a perfect number between 1 and 10.

Question 4. Find the common factors of:
(a) 20 and 28
(b) 35 and 50
(c) 4, 8 and 12

(d) 5, 15 and 25

Solution: (a) Factors of 20 are 1,2,4, 5, 10 and 20.
Factors of 28 are 1, 2,4, 7, 14 and 28.
Common factors of 20 and 28 are 1, 2 and 4.

(b) Factors of 35 are 1, 5, 7 and 35.
Factors of 50 are 1, 2, 5, 10, 25 and 50.
Common factors of 35 and 50 are 1 and 5.

(c) Factors of 4 are 1, 2 and 4.
Factors of 8 are 1, 2,4 and 8.
Factors of 12 are 1,2, 3,4,6 and 12.
Common factors of 4,8 and 12 are 1,2 and 4.

(d) Factors of 5 are 1 and 5.
Factors of 15 are 1, 3, 5 and 15.
Factors of 25 are 1, 5 and 25.
Common factors of 5,15 and 25 are 1 and 5.

Question 5. Find any three numbers that are multiples of 25 but not multiples of 50.

Solution: Multiples of 25 are: 25, 50, 75, 100, 125, 150, 175, …
Multiples of 50 are: 50, 100, 150, 200, 250, …
∴ The numbers that are multiples of 25 but not multiples of 50 are 25, 75, 125, 175,…

Question 6. Anshu and his friends play the 'idli-vada' game with two numbers, which are both smaller than 10. The first time anybody says 'idli-vada' is after the number 50. What could the two numbers be which are assigned 'idli' and 'vada'?

Solution: The pair of numbers smaller than 10 with first common multiple greater than 50 are (7, 8), (8, 9) and (7, 9).
For (7, 8):
If 7, 14, 21, 28, 35, …, 49, 56, 63, … are said 'idli'.
And 8, 16, 24, 32, …, 48, 56, 64, … are said 'vada'.
Then 56 is the first number (first common multiple of 7 and 8) greater than 50 which would be said 'idli-vada'.

For (8, 9):
If 8, 16, 24, 32, …, 48, 56, 64, 72, … are said 'idli'.
And 9, 18, 27, 36, …, 54, 63, 72, … are said 'vada'.
Then 72 is the first number (first common multiple of 8 and 9) greater than 50 which would be said 'idli-vada'.

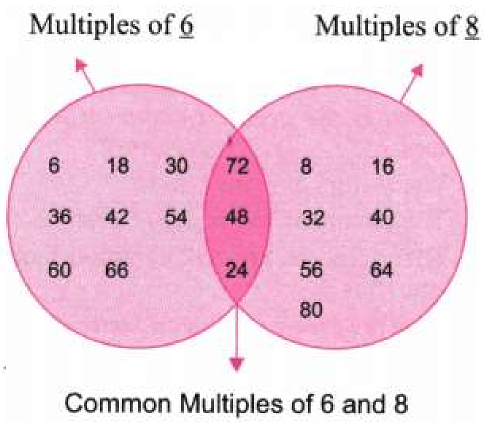
For (7, 9):
If 7, 14, 21, 28, …, 49, 56, 63, 70, … are said ‘idli’.
And 9, 18, 27, 36, …, 54, 63, 72, … are said ‘vada’.
Then 63 is the first number (first common multiple of 7 and 9) greater than 50 which would be said ‘idli-vada’.

Question 7. In the treasure hunting game, Grumpy has kept treasures on 28 and 70. What jump sizes will land on both the numbers?

Solution: In the treasure hunting game, if Grumpy has kept treasures on 28 and 70, then the common factor of 28 and 70 will be the jump sizes to land on both the numbers.
Therefore,
Factors of 28 are: 1, 2, 4, 7, 14, and 28.
Factors of 70 are: 1, 2, 5, 7, 10, 14, 35 and 70.
The common factors of 28 and 70 are: 1, 2, 7, and 14. Thus, the possible jump sizes to land on both the numbers will be 1, 2, 7, and 14.

Question 8. In the diagram below, Guna has erased all the numbers except the common multiples. Find out what those numbers could be and fill in the missing numbers in the empty regions.

Solution: Multiples of 6 Multiples of 8



Here 6 could also be replaced by 3.
As 24, 48, 72, are also common multiples of 3 and 8.

Question 9. Find the smallest number that is a multiple of all the numbers from 1 to 10 except for 7.

Solution: To find smallest number that is a multiple of all the numbers between 1 and 10 (both inclusive), let us first find the LCM of all the numbers between 1 and 10 except 7.
Here, 1 = 1
2 = 2
3 = 3
4 = 2 × 2
5 = 5

6 = 2 × 3
8 = 2 × 2 × 2
9 = 3 × 3
10 = 2 × 5
∴ LCM = Product of the highest power of the prime factors including other factors
= 2 × 2 × 2 × 3 × 3 × 5
= 360
Hence, the smallest number that is a multiple of all the numbers from 1 to 10 except for 7 is 360.

Question 10. Find the smallest number that is a multiple of all the numbers from 1 to 10.

Solution:
The smallest number that is a multiple of all the numbers from 1 to 10 will be least common multiples of that numbers.

2	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
2	1, 1, 3, 2, 5, 3, 7, 4, 9, 5
3	1, 1, 3, 1, 5, 3, 7, 2, 9, 5
5	1, 1, 1, 1, 5, 1, 7, 2, 3, 5
	1, 1, 1, 1, 1, 1, 7, 2, 3, 1

2 × 2 × 3 × 5 × 7 × 2 × 3 = 2520
Thus, the smallest number that is a multiple of all the numbers from 1 to 10 will be 2520.

InText Questions

Question 1. How many prime numbers are there from 21 to 30? How many composite numbers are there from 21 to 30? (Page 113)

Solution: There are 2 prime numbers, (i.e., 23,29) and 8 composite numbers (i.e., 21,22, 24, 25, 26, 27, 28 and 30) from 21 to 30.

Figure it Out (Page No. 114 – 115)

Question 1. We see that 2 is a prime and also an even number. Is there any other even prime?
Solution: No, there is no other prime number. 2 is also the smallest prime number.

Question 2. Look at the list of primes to 100. What is the smallest difference between two successive primes? What is the largest difference?

Solution: The smallest difference between two successive primes is 1 = 3 – 2
The largest difference between two successive primes is 8 = 97 – 89.

Question 3. Are there an equal number of primes occurring in every row in the table on the previous page? Which decades have the least number of primes? Which have the most number of primes?
Solution: No, the number of primes occurring in every row are not equal.
The decade 91 to 100 has least number of primes i.e. 1.
The decades having most number of primes are 1 to 10 and 11 to 20 (4 primes)

Question 4. Which of the following numbers are prime? 23, 51, 37, 26
Solution: 23 = 1 × 23, 23 = 23 × 1
Since, 23 has only two factors i.e. 1 and 23.
Therefore, 23 is a prime number.
51 = 1 × 51, 51 = 3 × 17
Since, 51 has four factors i.e. 1, 3,17 and 51.
Therefore, 51 is not a prime number.
37 = 1 × 37, 37 = 37 × 1
Since, 37 has only two factors i.e. 1 and 37.
Therefore, 37 is a prime number.
26 = 1 × 26, 26 = 2 × 13
Since, 26 has four factor i.e. 1,2,13 and 26.
Therefore, 26 is not a prime number.

Question 5.
Write three pairs of prime numbers less than 20 whose sum is a multiple of 5.

Solution: The pairs of prime numbers less than 20 whose sum is a multiple of 5 are as follows:
(2, 3) as 2 + 3 = 5 which is a multiple of 5.
(3, 7) as 3 + 7 = 10 which is a multiple of 5.
(2, 13) as 2 + 13 = 15 which is a multiple of 5.
(7, 13) as 7 + 13 = 20 which is a multiple of 5.
(3, 17) as 3 + 17 = 20 which is a multiple of 5.
(Answer may vary)

Question 6. The numbers 13 and 31 are prime numbers. Both these numbers have same digits 1 and 3. Find such pairs of prime numbers up to 100.

Solution: Required pairs of prime numbers up to 100 having the same digits are: 17 and 71; 37 and 73; 79 and 97.

Question 7.
Find seven consecutive composite numbers between 1 and 100.
Solution:
Seven consecutive composite numbers between 1 and 100 are: 90, 91, 92, 93, 94, 95, and 96.

Question 8. Twin primes are pairs of primes having a difference of 2. For example, 3 and 5 are twin primes. So are 17 and 19. Find the other twin primes between 1 and 100.

Solution: The twin primes (other than 3 and 5; 17 and 19) between 1 and 100: (5, 7), (11, 13), (29, 31), (41, 43), (59, 61), and (71, 73).

Question 9.
Identify whether each statement is true or false. Explain.
(a) There is no prime number whose unit digit is 4.
(b) A product of primes can also be prime.
(c) Prime numbers do not have any factors.
(d) All even numbers are composite numbers.
(e) 2 is a prime and so is the next number, 3. For every other prime, the next number is composite.
Solution:
(a) True – The reason is that if the unit digit is 4 the number will become an even number.
(b) False – A product of primes can't be prime because the product of primes is also divisible by the numbers itself.
(c) False – They also have two factors i.e., 1 and number itself.
(d) False – 2 has two factors 1 and 2, so except 2 all even numbers are composite.
(e) True – Except 2, for every prime number the next number is composite.

Question 10. Which of the following numbers is the product of exactly three distinct prime numbers: 45, 60, 91, 105, 330?

Solution: $45 = 3 \times 3 \times 5$. They are not distinct as it has two 3's.
$60 = 2 \times 2 \times 3 \times 5$. They are not distinct as it has two 2's.
$91 = 7 \times 13$. It has only two distinct prime factors.
$105 = 3 \times 5 \times 7$. It has three distinct prime factors 3, 5, and 7.
$330 = 2 \times 3 \times 5 \times 11$. It has four distinct prime factors.
Thus, only 105 is the product of 3 distinct prime numbers.

Question 11. How many three-digit prime numbers can you make using each of 2, 4 and 5 once?

Solution: 2, 4 and 5 cannot form a single prime number.
Because, when its units digit is 2 or 4 it is divided by 2, and when units digits is 5 it is divided by 5 so that's why 2, 4 and 5 cannot form a prime number.

Question 12. Observe that 3 is a prime number, and $2 \times 3 + 1 = 7$ is also a prime.
Are there other primes for which doubling and adding 1 gives another prime? Find at least five such examples.

Solution: We can have primes as:

$2 \times 2 + 1 = 5$, prime number;
$2 \times 5 + 1 = 11$, prime number;
$2 \times 11 + 1 = 23$, prime number;
$2 \times 23 + 1 = 47$, prime number;
$2 \times 29 + 1 = 59$, primfe number;
and $2 \times 41 + 1 = 83$, prime number;
Thus, 2, 5, 11, 23, 29 and 41 are required primes. (Answer may vary)

InText Questions

Question 1. Which of the following pairs of numbers are co-prime? (Page 116)
(a) 18 and 35
(b) 15 and 37
(c) 30 and 415
(d) 17 and 69
(e) 81 and 18

Solution: (a) 18 and 35
Factors of 18 are 1, 2, 3, 6, 9 and 18
Factors of 35 are: 1, 5, 7 and 35
Since, 18 and 35 have no common factor except 1.
Thus, 18 and 35 are co-prime numbers.

(b) 15 and 37
Factors of 15 are: 1, 3, 5 and 15
Factors of 37 are: 1, 37
Since, 15 and 37 have no common factor except 1.
Thus, 15 and 37 are co-prime numbers.

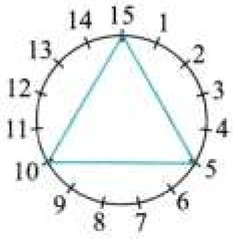
(c) 30 and 415
Factors of 30 are: 1, 2, 3, 5, 6, 10, 15 and 30
Factors of 415 are: 1,5,83 and 415
Their common factors are: 1 and 5
Thus, 30 and 415 are not co-prime numbers.

(d) 17 and 69
Factors of 17 are: 1 and 17
Factors of 69 are: 1, 3, 23 and 69
Since, 17 and 69 have no common factor except 1.
Thus, 17 and 69 are co-prime numbers.

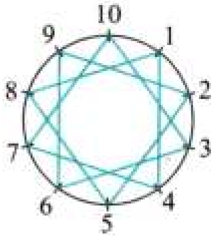
(e) 81 and 18
Factors of 81 are: 1, 3, 9, 27 and 81
Factors of 18 are: 1, 2, 3, 6, 9 and 18

Common factors of 81 and 18 are 3 and 9 other than 1.
Thus, 81 and 18 are not co-prime numbers.

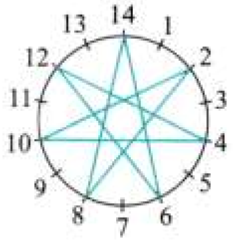
Question 2. Make such pictures for the following: (Page 117)
(a) 15 pegs, thread-gap of 10
Solution:



(b) 10 pegs, thread-gap of 7
Solution:



(c) 14 pegs, thread-gap of 6
Solution:



(d) 8 pegs, thread-gap of 3
Solution:

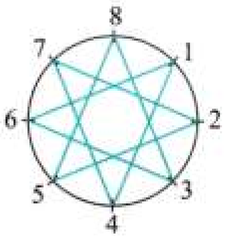


Figure it Out (Page No. 120)

Question 1. Find the prime factorizations of the following numbers: 64, 104, 105, 243, 320, 141, 1728, 729, 1024, 1331, 1000.

Solution: (a) The prime factorization of 64 is 2 × 2 × 2 × 2 × 2 × 2.

(b) The prime factorization of 104 is 2 × 2 × 2 × 13.
(c) The prime factorization of 105 is 3 × 5 × 7.
(d) The prime factorization of 243 is 3 × 3 × 3 × 3 × 3.
(e) The prime factorization of 320 is 2 × 2 × 2 × 2 × 2 × 2 × 5.
(j) The prime factorization of 141 is 3 × 47.
(g) The prime factorization of 1728 is 2 × 2 × 2 × 2 × 2 × 2 × 3 × 3 × 3.
(h) The prime factorization of 729 is 3 × 3 × 3 × 3 × 3 × 3.
(f) The prime factorization of 1024 is 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2.
(j) The prime factorization of 1331 is 11 × 11 × 11.
(k) The prime factorization of 1000 is 2 × 2 × 2 × 5 × 5 × 5.

Question 2. The prime factorization of a number has one 2, two 3s, and one 11. What is the number?

Solution: To find the number, we multiply these prime factors together:
2 × 3 × 3 × 11 = 198
Thus, the number is 198.

Question 3. Find three prime numbers, all less than 30, whose product is 1955.

Solution: The prime factorization of 1955:
1955 = 5 × 17 × 23
All the factors are prime numbers and are less than 30.
Hence, the three prime numbers whose product is 1955 are 5, 17, and 23.

Question 4.
Find the prime factorization of these numbers without multiplying first.
(a) 56 × 25
(b) 108 × 75
(c) 1000 × 81

Solution: (a) Prime factors of 56 = 2 × 2 × 2 × 7 and 25 = 5 × 5
Without multiplying 56 × 25 = 2 × 2 × 2 × 7 × 5 × 5
(b) Prime factors of 108 = 2 × 2 × 3 × 3 × 3 and 75 = 3 × 5 × 5
Without multiplying 108 × 75 = 2 × 2 × 3 × 3 × 3 × 3 × 5 × 5
(c) Prime factors of 1000 = 2 × 2 × 2 × 5 × 5 × 5 and 81 = 3 × 3 × 3 × 3
Without multiplying 1000 × 81 = 2 × 2 × 2 × 5 × 5 × 5 × 3 × 3 × 3 × 3

Question 5. What is the smallest number whose prime factorization has:
(i) Three different prime numbers?
(ii) Four different prime numbers?

Solution:(i) The smallest number whose prime factorization has three different prime numbers is 2 × 3 × 5 = 30.

(ii) The smallest number whose prime factorization has four different prime numbers is 2 × 3 × 5 × 7 = 210.

Figure it Out (Page No. 122)

Question 1. Are the following pairs of numbers co-prime? Guess first and then use prime factorisation to verify your answer.
(a) 30 and 45
(b) 57 and 85
(c) 121 and 1331
(d) 343 and 216

Solution: (a) 30 and 45
30 = 2 × 3 × 5
45 = 3 × 3 × 5
Clearly, 3 and 5 are the common factors of 30 and 45.
So, these are not co-prime numbers.

(b) 57 and 85
57 = 3 × 19
85 = 5 × 17
Clearly, there is no any common prime factor of 57 and 85.
So, these are co-prime numbers.

(c) 121 and 1331
121 = 11 × n
1331 = 11 × 11 × 11
Clearly, 11 and 11 are the common factors of 121 and 1331.
So, these are not co-prime numbers.

(d) 343 and 216
343 = 7 × 7 × 7
216 = 2 × 2 × 2 × 3 × 3 × 3
Clearly, there is no any common prime factor of 343 and 216.
So, these are co-prime numbers.

Question 2. Is the first number divisible by the second? Use prime factorisation.
(a) 225 and 27
(b) 96 and 24
(c) 343 and 17
(d) 999 and 99

Solution: (i) Prime factorisation of 225 and 27 are 225 = 3 × 3 × 5 × 5
27 = 3 × 3 × 3

All prime factors of 27 are also prime factors of 225. But the prime factorisation of 12 is not included in the prime factorisation of 225.
This is because 3 occurs thrice in the prime factorisation of 27 but twice in the prime factorisation of 225. This means that 225 is not divisible by 27.

(ii) Prime factorisation of 96 and 24 are
$96 = 2 \times 2 \times 2 \times 2 \times 2 \times 3$,
$24 = 2 \times 2 \times 2 \times 3$
Since, we can multiply in any order,
$96 = 24 \times 4$
Therefore, 96 is divisible by 24.

(iii) Prime factorisation of 343 and 17 are
$343 = 7 \times 7 \times 7$ and $17 = 17$
The prime factorisation of 343 is $7 \times 7 \times 7$ and 17 is a prime number with no common factor with 343.
Therefore, 343 is not divisible by 17.

(iv) Prime factorisation of 999 and 99 are
$999 = 3 \times 3 \times 111$,
$99 = 3 \times 3 \times 11$
Prime factorisation of 99 is not included in the prime factorisation of 999.
Therefore, 999 is not divisible by 99.

Question 3. Explore and find out if each statement is always true, sometimes true, or never true. You can give examples to support your reasoning.
(i) The sum of two even numbers gives a multiple of 4.
(ii) The sum of two odd numbers gives a multiple of 4.

Solution: (i) The sum of two even numbers gives a multiple of 4.
This statement is sometimes true.
Example: when it is true; $10 + 18 = 28$ is a multiple of 4.
When it is false; $10 + 16 = 26$ is not a multiple of 4.

(ii) The sum of two odd numbers gives a multiple of 4.
This statement is sometimes true.
Example: when it is true; $3 + 5 = 8$ is a multiple of 4.
When it is false; $7 + 11 = 18$ is not a multiple of 4.

These statements are always true:
The sum of two even numbers is always even.
Example: $2 + 4 = 6$, $16 + 28 = 44$.
The sum of two odd numbers is always even.
Example: $3 + 5 = 8$, $7 + 19 = 26$

The multiple of odd numbers and even numbers is always even.
Example: $2 \times 3 = 6$, $7 \times 8 = 56$
The statement is sometimes true:
Multiple rational and irrational numbers are sometimes rational and sometimes irrational numbers.
Example: $\sqrt{3} \times 2 = 2\sqrt{3}$, $\sqrt{3} \times 0 = 0$

Question 4. Guna says, "Any two prime numbers are co-prime". Is he right?

Solution: Yes, he is right.
Any two prime numbers are co-prime to each other, as every prime number has only two factors 1 and the number itself, the only common factor of two prime numbers will be 1.

Figure it Out (Page No. 15-17)

Question 1. 2024 is a leap year (as February has 29 days). Leap years occur in the years that are multiples of 4, except for those years that are evenly divisible by 100 but not 400.
(a) From the year you were born till now, which years were leap years?
(b) From the year 2024 till 2099, how many leap years are there?

Solution: (a) From the year 2010 till 2024, there are 4 leap years. 2012, 2016, 2020 and 2024.
(b) The leap years from 2024 and 2099 are:
2024, 2028, 2032, 2036, 2040, 2044, 2048, 2052, 2056, 2060, 2064, 2068, 2072, 2076,, 2080, 2084, 2088, 2092, 2096.
Hence, there are 19 leap years from 2024 till 2099.

Question 2.
Find the largest and smallest 4-digit numbers that are divisible by 4 and are also palindromes.

Solution: First, we understand the meaning of palindromes, A palindromic number (also known as a numeral palindrome or a numeric palindrome) is a number (such as 131, 555, 1441, 16461) that remains the same when its digits are reversed.
The largest 4-digit palindrome number is 9999 and the largest palindrome number which is divisible by 4 is 8888.
The smallest 4-digit palindrome number which is divisible by 4 is 2112.

Question 3. Explore and find out if each statement is always true, sometimes true or never true. You can give examples to support your reasoning.
(a) Sum of two even numbers gives a multiple of 4.
(b) Sum of two odd numbers gives a multiple of 4.

Solution:(a) Sometimes true. The sum of two even numbers is not always a multiple of 4.

As,
2 (even) + 4 (even) = 6 (even) which is not multiple of 4.
2 (even) + 6 (even) = 8 (even) multiple of 4.
4 (even) + 6 (even) =10 (even) which is not multiple of 4.
4 (even) + 8 (even) = 12 (even) which is multiple of 4.

(b) Sometimes true. The sum of two odd numbers is not always a multiple of 4.
3 (odd) + 5 (odd) = 8 (even) which is a multiple of 4.
5 (odd) + 7 (odd) =12 (even) which is a multiple of 4.
1 (odd) + 5 (odd) = 6 (even) which is not divisible by 4. So, it is not a multiple of 4.
7 (odd) + 11 (odd) = 18 (even) which is not divisible by 4. So, it is not a multiple of 4.

Question 4. Find the remainders obtained when each of the following numbers are divided by
(i) 10
(ii) 5
(iii) 2.
78, 99, 173, 572, 980, 1111, 2345

Solution: Here we have to divide 78 by 10, 5 and
2 then

(*i*) 10)78(7
70
8 — Remainder

∴ Remainder = 8.

(*ii*) 5)99(19
5
49
45
4

∴ Remainder = 4

(*iii*) 2)78(39
6
18
18
×

∴ Remainder = 0

Now do yourself:
99/10: Remainder = 9, 99/5: Remainder = 4, 99/2: Remainder = 1
173/10: Remainder = 3, 173/5: Remainder = 3, 173/2: Remainder = 1
572/10: Remainder = 2, 572/5: Remainder = 2, 572/2: Remainder = 0
980/10: Remainder = 0,980/5: Remainder = 0, 980/2: Remainder = 0
1111/10: Remainder= 1,1111/5: Remainder= 1, 1111/2: Remainder = 1
2345/10: Remainder 5,2345/5: Remainder = 0, 2345/2: Remainder = 1

Question 5. The teacher asked if 14560 is divisible by all of 2, 4, 5, 8 and 10. Guna checked for divisibility of 14560 by only two of these numbers and then declared that it was also divisible by all of them. What could those two numbers be?

Solution: Since, 14560 is an even number, and the number formed by last 3 digits (560) is divisible by 8 as 560 ÷ 8 = 70.
Thus, 14560 is divisible by 8.
Also, 14560 ends with 0 so, it is also divisible by 5 and 10 as well.
If a number is divisible by 8 and 10, it must be divisible by 2, 4 and 5 also.
So, Guna could have checked for divisibility by 8 and 10 to determine the number is divisible by all 2, 4, 5, 8 and 10.

Question 6. Which of the following numbers are divisible by all of 2, 4, 5, 8 and 10: 572, 2352, 5600, 6000, 77622160.
Solution: The last digit of 14560 is 0, therefore it is divisible by 5 and 10 both. Thus, 5 and 10 could be those two numbers.

Question 7. Write two numbers whose product is 10000. The two numbers should not have 0 as the units digit.

Solution: For 572
The last digit of 572 is 2, therefore it is divisible by 2.
The number formed by last two digits is divisible by 4,
therefore 572 is divisible by 4.
The last digit of 572 is not 0 or 5, therefore it is not divisible by 5.
The number 572 is not divisible by 8.
The last digit of 572 is not 0, therefore it is not divisible by 10.

For 2352
The last digit of 2352 is 2, therefore 2352 is divisible by 2.
The number formed by last two digits is divisible by 4, therefore 2352 is divisible by 4.
The last digit is not 0 or 5, therefore it is not divisible by 5.
The number formed by last 3-digits is divisible by 8, therefore it is divisible by 8.
The last digit of 2352 is not 0, therefore it is not divisible by 10.

For 5600
The last digit of 5600 is 0, therefore it is divisible by 2, 5 and 10.
The number formed by last two digits of 5600 is divisible by 4, therefore it is divisible by 4.
The number formed by last 3 digits is divisible by 8, therefore it is divisible by 8.

For 6000
The last digit of 6000 is 0, therefore it is divisible by 2, 5, and 10.
The number formed by last two-digits is divisible by 4, therefore it is divisible by 4.
The number formed by last three-digits is divisible by 8, therefore it is divisible by 8.

For 77622160
The last digit of 77622160 is 0, therefore it is divisible by 2, 5 and 10.
The number formed by last two digits of 77622160 is divisible by 4, therefore it is divisible

by 4.

The number formed by last three digits of 77622160 is divisible by 8, therefore it is divisible by 8.

Intext Questions

Question 1.
A Prime Puzzle.
Fill the grid with prime numbers only so that the product of each row is the number to the right of the row and the product of each column is the number below the column. (Pages 127-128)

			105
			20
			30
28	125	18	

			8
			105
			70
30	70	28	

			63
			27
			190
45	42	171	

			343
			660
			44
28	154	231	

Solution:

7	5	3	**105**
2	5	2	**20**
2	5	3	**30**
28	**125**	**18**	

2	2	2	**8**
3	5	7	**105**
5	7	2	**70**
30	**70**	**28**	

3	7	3	**63**
3	3	3	**27**
5	2	19	**190**
45	**42**	**171**	

7	7	7	**343**
2	11	3	**66**
2	2	11	**44**
28	**154**	**231**	