Playing With Numbers

Exercise 2.1

Question: 1

Define:

Solution:

(i) Factor: A factor of a number is an e×act divisor of that number. For e×ample, 4 e×actly divide 32. Therefore, 4 is a factor of 32.

Examples of factors are:

2 and 3 are factors of 6 because 2 × 3= 6

2 and 4 are factors of 8 because 2 × 4= 8

3 and 4 are factors of 12 because 3 × 4 = 12

3 and 5 are factors of 15 because 3 × 5 = 15

(ii) Multiple: When a number ‘a’ is multiplied by another number ‘b’, the product is the multiple of both the numbers ‘a’ and ‘b’.

Examples of multiples:

6 is a multiple of 2 because 2 × 3= 6

8 is a multiple of 4 because 4 × 2 = 8

12 is a multiple of 6 because 6 × 2 = 12

21 is a multiple of 7 because 7 × 3 = 21

Question: 2

Write all factors of each of the following numbers:

Solution:

(i) 60

60= 1 × 60

60= 2 × 30

60 = 3 × 20

60 = 4 × 15

60 = 5 × 12

60 = 6 × 10

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

(ii) 76

76 = 1 × 76

76 = 2 × 38

76 = 4 × 19

Therefore, The factors of 76 are 1, 2, 4, 19, 38 and 76.

(iii) 125

125 = 1 × 125

125 = 5 × 25

Therefore, the factors of 125 are 1, 5, 25 and 125.

(iv) 729

729 = 1 × 729

729 = 3 × 243

729 = 9 × 81

729 = 27 × 27

Therefore, the factors of 729 are 1, 3, 9, 27, 81, 243 and 729.

Question: 3

Write first five multiples of each of the following numbers:

Solution:

(i) 25

The first five multiples of 25 are as follows:

25 × 1 = 25

25 × 2 = 50

25 × 3 = 75

25 × 4 = 100

25 × 5 = 125

(ii) 35

The first five multiples of 35 are as follows:

35 × 1 = 35

35 × 2 = 70

35 × 3 = 105

35 × 4 = 140

35 × 5 = 175

(iii) 45

The first five multiples of 45 are as follows:

45 × 1 = 45

45 × 2 = 90

45 × 3 = 135

45 × 4 = 180

45 × 5 = 225

(iv) 40

The first five multiples of 40 are as follows:

40 × 1 = 40

40 × 2 = 80

40 × 3 = 120

40 × 4 = 160

40 × 5 = 200

Question: 4

Which of the following number have 15 as their factor?

Solution:

(i) 15625

15 is not a factor of 15,625 because it is not a divisor of 15,625.

(ii) 123015

15 is a factor of 1,23,015 because it is a divisor of 1,23,015. i.e., 8,201 × 15 = 1, 23,015

Question: 5

Which of the following number are divisible by 21?

Solution:

We know that a given number is divisible by 21 if it is divisible by each of its factors. The factors of 21 are 1, 3, 7 and 21.

(i) 21063

Sum of the digits of the given number = 2 + 1 + 0 + 6 + 3 = 12 which is divisible by 3.

Hence, 21,063 is divisible by 3.

Again, a number is divisible by 7 if the difference between twice the one's digit and the number formed by the other digits is either 0 or a multiple of 7. 2,106 – (2 × 3) = 2,100 which is a multiple of 7. Thus, 21,063 is divisible by 21.

(ii) 20163

Sum of the digits of the given number = 2 + 0 + 1 + 6 + 3 = 12 which is divisible by 3. Hence, 20,163 is divisible by 3.

Again, a number is divisible by 7 if the difference between twice the one's digit and the number formed by the other digits is either 0 or multiple of 7. 2016 – (2 × 3) = 2010 which is not a multiple of 7. Thus, 20,163 is not divisible by 21.

Question: 6

Without actual division show that 11 is a factor of each of the following numbers:

Solution:

(i) 1,111

The sum of the digits at the odd places = 1 + 1 = 2

The sum of the digits at the even places = 1 + 1 = 2

The difference of the two sums = 2 – 2 = 0

Therefore, 1,111 is divisible by 11 because the difference of the sums is zero.

(ii) 11,011

The sum of the digits at the odd places = 1 + 0 + 1 = 2

The sum of the digits at the even places = 1 + 1 = 2

The difference of the two sums = 2 – 2 = 0

Therefore, 11,011 is divisible by 11 because the difference of the sums is zero.

(iii) 1, 10,011

The sum of the digits at the odd places = 1 + 0 + 1 = 2

The sum of the digits at the even places = 1 + 0 + 1 = 2

The difference of the two sums = 2 – 2 = 0

Therefore, 1, 10,011 is divisible by 11 because the difference of the sums is zero.

(iv) 11, 00,011

the sum of the digits at the odd places = 1 + 0 + 0 + 1 = 2

The sum of the digits at the even places = 1 + 0 + 1 = 2

The difference of the two sums = 2 – 2 = 0

Therefore, 11, 00,011 is divisible by 11 because the difference of the sums is zero.

Question: 7

Without actual division show that each of the following numbers is divisible by 5:

Solution:

A number will be divisible by 5 if the unit's digit of that number is either 0 or 5.

(i) 5

In 55, the unit's digit is 5. Hence, it is divisible by 5.

(ii) 555

In 555, the unit's digit is 5. Hence, it is divisible by 5.

(iii) 5555

In 5,555, the unit's digit is 5. Hence, it is divisible by 5.

(iv) 50,005

In 50,005, the unit's digit is 5. Hence, it is divisible by 5.

Question: 8

Is there any natural number having no factor at all?

Solution:

No, because each natural number is a factor of itself

Question: 9

Find numbers between 1 and 100 having exactly three factors

Solution:

The numbers between 1 and 100 having exactly three factors are 4, 9, 25, and 49.

The factors of 4 are 1, 2 and 4.

The factors of 9 are 1, 3 and 9.

The factors of 25 are 1, 5 and 25.

The factors of 49 are 1, 7 and 49.

Question: 10

Sort out even and odd numbers:

Solution:

A number which is exactly divisible by 2 is called an even number. Therefore, 42 and 144 are even numbers.

A number which is not exactly divisible by 2 is called an odd number. Therefore, 89 and 321 are odd numbers.