CHAPTER-9

PLAYING WITH NUMBERS

STUDY NOTE

Factors

A factor of a number is an exact divisor of that number.
Examples :
The divisors of 4 are 1, 2 and 4. Hence the factors of 4 are 1, 2, 4.
The divisors of 12 are 1, 2, 3, 4, 6 and 12. Hence 1, 2, 3, 4, 6 and 12 are the factors of 12.
Note:

- 1 is a factor of every number.
- Every number is a factor of itself.
- Every factor is less than or equal to the given number.
- The number of factors of a given number is finite.

Prime and Composite Factors

- The numbers, other than 1, whose only factors are 1 and the number itself are called prime numbers.
  Examples: 2, 5, 13
  Factors of 2 are 1, 2.
  Factors of 5 are 1, 5.
  Factors of 13 are 1, 13.
- Numbers having more than two factors are called composite factors.
  Example: 4, 6, 12.

Factors of 4 are 1, 2, 4
Factors of 6 are 1, 2, 3, 6
Factors of 12 are 1, 2, 3, 4, 6, 12

- Factors of a number which are prime numbers are called prime factors.
  Example: 1, 2, 3, 4, 6 and 12 are factors of 12.
  2 and 3 are prime numbers. Hence 2 and 3 are prime factors of 12.

Multiples

- A multiple of a number is that number multiplied by an integer. Examples : Multiples of 3 are 3, 6, 9, 12, …
  Multiples of 8 are 8, 16, 24, 32, …
- A number which is a multiple of 2 is called an even number.
- A number which is not a multiple of 2 or is not even, is called an odd number.
- Note:
  - Every number is a multiple of itself.
  - Every multiple of a number is greater than or equal to that number.
  - The number of multiples of a given number is infinite.

Divisibility Tests

- A number is divisible by 2, if the digit in the ones place is an even number or zero.
  Example: 12, 246, 340 are divisible by 2.

- A number is divisible by 3, if sum of its digits is divisible by 3.
  Example: 15, 27, 363 are divisible by 3.

- A number with three or more digits is divisible by 4, if the number formed by its last two digits is divisible by 4.
  Example: 436, 104, 14496 are divisible by 4.

- A number is divisible by 5, if the digit in the ones place is 5 or 0.
  Example:50, 145, 375 are divisible by 5.

- A number is divisible by 6, if it is divisible by both 2 and 3.
  Example: 12, 36, 312 are divisible by 6.

- A number with four or more digits is divisible by 8, if the number formed by the last three digits is divisible by 8.
  Example: 1912, 1024, 71968 are divisible by 8.

- A number is divisible by 9, if the sum of the digits of the number is divisible by 9.
  Example: 54, 774, 7839 are divisible by 9.

- A number is divisible by 10, if it has 0 in the ones place.
  Example: 100, 390, 6570 are divisible by 10.

- Find the difference between the sum of digits at odd places (from the right) and the sum of digits at even places (from the right) of the number. If the difference is either 0 or divisible by 11, then the number is divisible by 11.
  Example: 1375, 2838, 82819 are divisible by 11.
- If a number is divisible by another number then it is divisible by each of the factors of that number.
  Example: 18 is divisible by 6.
  2 and 3 are factors of 6.
  18 is divisible by 2 and 3 as well.

- If a number is divisible by two co-prime numbers then it is divisible by their product also.
  Example: 80 is divisible by 4 and 5. 80 is also divisible by 4 × 5 = 20. 4 and 5 are co-prime numbers.

- If two given numbers are divisible by a number, then their sum is also divisible by that number.

Example: 16 and 20 are divisible by 4. 16 + 20 = 36 is also divisible by 4.

- If two given numbers are divisible by a number, then their difference is also divisible by that number.
  Example: 40 and 12 are divisible by 4. 40 – 12 = 28 is also divisible by 4.

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