# Playing with numbers

- A number is said to be in general form if it is expressed as the sum of the products of its digits with their respective place values
- A two digit number ab can be written in general form as 10a +b
- A three digit number abc is written in general for as 100a + 10 b +c
- General form of numbers is helpful in solving numerical puzzles called cryptorithms; letters are used in place of digits in arithmetic form

Results and consequences:

- If ab is the given number and ba is the number formed by reversing the digits
  Sum; ab + ba ; is always divisible by 11 and by (a+b)
  Difference ; (ab-ba ) : is divisible by 9 and by (a – b)
- A + A + A = A only when A=0 or 5
- abc + bca + cab is exactly divisible by: 3, 37, 11 and (a+ b + c)
- abc + cba is always a multiple of 99

| Tests of divisibility | |
|---|---|
| n | Test performed for divisibility of the given number by n |
| 2 | Ones digit or units place of the number should be 0, 2, 4 6 or 8 ; number should be even |
| 3 | Sum of the digits of the number is divisible by 3 |
| 4 | the number formed by its last two digits of the given is divisible by 4 |
| 5 | Units digit is 0 or 1 |
| 6 | If number is divisible by both 2 and 3 |
| 9 | Sum of the digits of the number is divisible by 9 |
| 10 | Ones digit is zero |
| 11 | difference of the sum of its digits in odd places and sum of digits in even places is either zero or a multiple of 11 |
| 12 | Divisible by both 3 and 4 |