

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 form as $100a + 10b + c$
- General form of numbers is helpful in solving numerical puzzles called cryptarithms; 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 5
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