Playing with Numbers

Numbers can be written in general form.

A two-digit number *ab* will be written as
$ab = 10a + b$

A three-digit number abc will be written as
abc= 100a+10b+c

A four-digit number abcd will be written as
abcd= 1000a+100b+10c+d

S.no	Divisibility	How it works
1	Divisibility by 10	Numbers ending with 0 are divisible by 10 **Why?** A three-digit number abc will be written as abc= 100a+10b+c So c has to be 0 for divisibility by 10
2	Divisibility by 5	Numbers ending with 0 and 5 are divisible by 5 **Why?** A three-digit number abc will be written as abc= 100a+10b+c So c has to be 0 or 5 for divisibility by 5
3	Divisibility by 2	Numbers ending with 0,2,4,6 and 8 are divisible by 2 **Why?** A three-digit number abc will be written as abc= 100a+10b+c So c has to be 2,4,6,8 or 0 for divisibility by 2
4	Divisibility by 3	The sum of digits should be divisible by 3 **Why?** A three-digit number abc will be written as

		abc= 100a+10b+c $=99c + 9b + (a + b + c)$ $=9(11c + b) + (a + b + c)$ Now 9 is divisible by 3, so sum of digits should be divisible by 3
5	Divisibility by 9	The sum of digits should be divisible by 9 **Why?** A three-digit number abc will be written as abc= 100a+10b+c $=99c + 9b + (a + b + c)$ $=9(11c + b) + (a + b + c)$ Now 9 is divisible by 9, so sum of digits should be divisible by 9
6	Divisibility by 11	The difference between the sum of digits at its odd places and that of digits at the even places should be divisible by 11 **Why?** $abcd = 1000a + 100b + 10c + d$ $= (1001a + 99b + 11c) – (a – b + c – d)$ $= 11(91a + 9b + c) + [(b + d) – (a + c)]$