Hello our dear readers, presently we will be talking about divisibility rules. Many of you have doubts related to this topic. So, let's discuss.

# Divisible rule

**Divisibility of 2:** A number is always divisible by 2 if it is an even number i.e. its last digit is 0, 2, 4, 6 or 8.

**Divisibility of 3:** A number is divisible by 3 if the sum of its digits is divisible by 3.

**Divisibility of 4:** A number is divisible by 4 if the last two digits of the number are divisible by 4.

**Divisibility of 5:** A number is divisible by 5 if its last digit is 0 or 5.

**Divisibility of 6:** A number is divisible by 6 if it is divisible by both 2 and 3.

**Divisibility of 8:** A number is divisible by 8 if its last 3 digits are divisible by 8.

**Divisibility of 10:** A number is divisible by 10 if its last digit is 0.

**Divisibility of 12:** A number is divisible by 12 if it is divisible by both 3 and 4. Now, we will discuss the divisibility rule of 7, 9, 11 and 13.

**Divisibility Rule of 9 and 11:**

**Divisibility Rule of 9:** A number is divisible by 9 if the sum of the digits of the number is multiple of 9. E.g. 356211 has sum of the digits, 3 + 5 + 6 + 2 + 1 + 1 = 18 and 18 had sum of the digits, 8 + 1 = 9, so 356211 is divisible by 9.

**Divisibility Rule of 11:** If the difference between the sum of the digits at odd places (from right) and the sum of the digits at even place (from right) is 0 or a multiple of 11, then it is divisible by 11. E.g. 356213 has the sum of the digits at odd places 3 + 2 + 5 = 10 and the sum of the digits at even places, 1 + 6 + 3 = 10. So 10 – 10 = 0. Hence it is divisible by 11.

The most interesting fact is, the divisibility rule of 9 and 11 is also applicable for 99, 999, 101, 1001, etc. but in a slightly different way. Let's understand this thing by taking an example of a number 'abcdefg' . This number is divisible by 9 if: (a + b + c + d + e + f + g) is 9 at the end (or a multiple of 9). This number is divisible by 99 if: (a + bc + de + fg) is divisible by 99. [Pairing from right side] This number is divisible by 999 if: (a + bcd + efg) is divisible by 999. [Tripling from right side] And so on....

Also, This number is divisible by 11 if: (g + e + c + a) – (d + f + b) is 0 or 11. This number is divisible by 101 if: (fg + bc) – (de + a) is 0 or a multiple of 101 [Pairing from right side] . This number is divisible by 1001 if: (efg + a) – (bcd) is 0 or a multiple of 1001 [Tripling from right side] And so on...

Let us take some examples to understand it clearly. E.g. Check whether 4636665 is divisible by 9, 99 and 999 or not. Sol: Divisibility by 9: 4 + 6 + 3 + 6 + 6 + 6 + 5 = 36 and 3 + 6 = 9 So, yes it is divisible by 9.

**Divisibility of 99:** (Pairing from right side) 4 + 63 + 66 + 65 = 198 So, yes it is divisible by 99 [Note: Since the number is divisible by 99. Hence, it is also divisible by all the factors of 99. And so, this number is divisible by 9]

**Divisibility of 999:** (Tripling from right side) 4 + 636 + 665 = 1305 So, no it is not divisible by 999. E.g. Check whether 8064143 is divisible by 11, 101, 1001. Sol: Divisibility by 11: (3 + 1 + 6 + 8) – (4 + 4 + 0) = 18 – 8 = 10 So, it is not divisible by 11.

**Divisibility of 101:** (Pairing from right side) (43 + 06) – (41 + 8) = 49 – 49 = 0 So, it is divisible by 101.

**Divisibility of 1001:** (Tripling from right side) (143 + 8) – (064) = 151 – 64 = 87 So, it is not divisible by 1001.

**Divisibility of 7 and 13:** We have a rule for 7 that if the difference between the number of tens in the number and twice the unit digit is divisible by 7. But it has some limitations. It is good for some small numbers like 651, 994, 1078 etc. but it is a very time consuming process for numbers like 456745. So, we can do some additional stuff here. We know how to find whether a number is divisible by 1001 or not. And, 1001 = 7 × 11 × 13 So, if a number is divisible by 1001 it will also be divisible by 7 and 13.

Divisibility rules help you in solving Number system and simplification questions in a quick way. Excel them to get good marks in exams.