Unit place deduction

Now that you know about the concept of place value system it's time to know what is unit place digit. The Unit Place Digit refers to the digit placed in the one's position of the particular number. It is the rightmost digit of the given number.

For example, the unit place digit of the number 457 is 7.

Unit Digit place of the Larger Numbers raised to the Power

It is easy to identify the Unit Place Digit of the smaller number but when it comes to the numbers raised to the larger power it becomes difficult to identify the same by simple observation. It is when the concept of cyclicity comes into the picture.

The cyclicity concept is based on the fact that every digit in the number has its own repetitive pattern when raised to any specific power. This particular concept makes it easy for the students to find the Unit Place Digit of the larger numbers and that too at much less time. So, let's learn about the cyclicity concept.

The following example will help to know about this concept.

Here mentioned is the cyclicity chart of 2:

2 ^ 1 = 2: Here, the unit digit is 2.

2 ^ 2 = 4: Here, the unit digit is 4.

2 ^ 3 = 8: Here, the unit digit is 8.

2 ^ 4 = 16: Here, the unit digit is 6.

2 ^ 5 = 32: Here, the unit digit is 2.

The above chart signifies that whenever the digit 2 is multiplied by itself the unit digit changes, except on the 4th multiplication. It is when 2 ^ 5 has the same last digit as 2 ^ 1. This implies that the cyclicity of digit 2 is 4.

Similarly, the cyclicity of all other single-digit numbers (1, 2, 3, 4, 5, 6, 7, 8, and 9) can be evaluated.

Now the question is how one can calculate the Unit Place Digit of the numbers raised to the power with the help of the cyclicity table?

You just have to follow the below-described steps to calculate the Unit Place Digit of the numbers having unit digits as 2,3,7, and 8 (x^y) with the help of the cyclicity table:

1. First, you are required to identify the unit digit in the base 'x' and call it to say 'n". For instance, the unit digit in the number 37 is 7 (n).
2. Next, divide the power of the number by 4.

- In case the power is exactly divisible by 4, i.e. the remainder is zero, then

- the unit digit of x^y will be 6, if n = 2,4,6, and 8.
- the unit digit of x^y will be 1, if n = 3,7, and 9.

- In case the power is not exactly divisible by 4, i.e. y = 4k + r, then
- the unit digit of x^y will be n^r

Now that the cyclicity of 1, 5, 6, and 10 is 1, the unit digit of a number raised to any power will remain the same, i.e. 1,5,6, and 10, respectively.

When it comes to the numbers having unit digits like 4 and 9, the cyclicity of these numbers is 2. In the case of the numbers having 4 and 9 as unit digits,

- When the powers of 4 and 9 will be even the unit digit will be 6 and 1, respectively.

When the powers of 4 and 9 will be odd the unit digit will be 4 and 9, respectively.

Conclusion

The Unit Place Digit in the place value system acts as the base of the student studying mathematics as the subject. Many questions related to the unit place digit are asked by the examiner in SSC exams. Therefore, it is imperative for the aspirant to know the concept of finding the unit place digit of the number using a cyclicity chart. Here his article will provide

all necessary information about unit place digit and calculation of it using the cyclicity concept.