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THE TECHNIQUES OF EXTENSION FOR THE MAGIC OF 1089

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Abstract

Mental Math is all about the calculations that we do in our mind without the use of pen, paper or calculator. This research paper determines the methods and techniques of Mental Math and the interpretation of the related algorithms. After analyzing the algorithms, the researcher managed to find some interesting techniques in order to speed up the thinking power. The study focuses on extension and then further extension of the techniques. The research on Mental Math has been conducted, by keeping in mind its importance in our lives. It is that tool which enhances one's self-reliance. The learning and understanding of the methods and techniques of Mental Math reduces over dependence on calculators. This exploration will ultimately empower students who are lacking in this amazing part of Mathematics. Mental Math not only stimulates the thinking process but also helps in the better understanding of the number system. A mathematical method can easily be understood if it is explained in terms of an algorithm, followed by an example and then generalizing the result. In this paper, the researcher will focus on the extension of magic of 1089 and the further extension of the number.

Keywords

Mental Math, Algorithm, Extension



1. Introduction

Nature has created human beings as one of the most exclusive products. It gifted humans with many abilities, and one of it is to calculate mentally. The ability to do calculations in our mind is known as Mental Math.

According to a definition, “mental math involves arithmetical calculations using only the human brain with no help from calculators, computers, or pen and paper” (Mental Calculation, 2019). Mental Math refers to the act of doing calculations in our mind. It is usually used as an approach to calculate an estimate rapidly using math facts; for example, division, multiplication, or double facts. The students, who practice mental math, make calculations in their minds without the assistance of pencil and paper works, calculators, or different guides. Mental Math is very usual and practical ability, and most people practice it on the daily basis. The students who use the techniques of mental math will find that it helps them not only in an educational institution, but in professional life as well (Morin, 2019).

Mental Math is that essential part of mathematics which revolves around all the basic facts of mathematics; for example, the person must be well-aware of the multiplication tables, squares of numbers, and so forth. Nevertheless, before these points, one should know the basic and most commonly used terminologies in mathematics to excel in this surprising field of mathematics. A lot of work had been done in this field, but the purpose of this research is to

study the methods and techniques to do calculations mentally. Furthermore, there is a need to do some calculations mentally to enhance the thinking power. The learning about the mental mathematical methods and techniques will help individuals at home, school, colleges, etc. In this paper, the researcher will discuss the techniques of the extension for the Magic of 1089. The technique just involves the use of simple mathematical operations.

2. Materials and Methods

A simple algorithm will be put forward in order to understand the techniques of the extension for the Magic of 1089.

3. Results

The following are the newly determined techniques of the extension for the magic of 1089 (Benjamin & Shermer, 1993/2006).

3.1 Extension of “*The Magic of 1089*”

To understand the extension, bring the following algorithm into consideration.

Take a 4-digit number in decreasing order. Subtract the reverse from it and then after following a simplification, add up the answers you got at first and then afterwards through simplification. Grab your calculator and check whether it comes out to be “10890” or not.

1. Select a four-digit number in decreasing order.
2. Reverse the selected number.
3. Subtract the reverse from the number you thought.
4. The answer you got in your mind, reverse it.

- Now add the number you obtained from step 3 and step 4.

Mathematical explanation lies below.

Let w, x, y and z be the unknown 4-digit number. The digit can be written in the form of thousands, hundreds, tens and units as

$$1000w + 100x + 10y + z$$

Reverse the number

$$1000z + 100y + 10x + w$$

Subtract the reverse from the number

$$(1000w + 100x + 10y + z) - (1000z + 100y + 10x + w)$$

By doing simplification we get,

$$999(w - z) + 90(x - y)$$

Hence we get the desired result.

The technique can be explained more simply by illustrating an example.

- Let the number be 9642.
- Reverse it i.e. 2469.
- Subtract the reverse from the number i.e. $9642 - 2469 = 7173$.
- Reverse the answer i.e. 3717.
- Add the answer to its reverse i.e. $7173 + 3717 = 10890$.

3.2 Further Extension for "The Magic of 1089"

Now to understand the further extension, have a look on the following algorithm.

For this particular extension, take a 5-digit number in decreasing order. Subtract the reverse from it. By doing a minor simplification, add up the answers you got at first and then afterwards. Check whether it comes out to be "109890" or not.

- Think of a five-digit number in a decreasing order.
- Reverse the number.
- Subtract the reverse from the number you thought.
- Reverse the answer you got.
- Add the answer to its reverse.

The mathematical explanation of this further extension lies below.

Let r, s, t, u and v be the hundred-thousand, thousands, hundreds, tens and unit places of the five-digit number.

$$10000r + 1000s + 100t + 10u + v$$

Reverse this number

$$10000v + 1000u + 100t + 10s + r$$

Subtract the reversed number from the original number

$$(10000r + 1000s + 100t + 10u + v) - (10000v + 1000u + 100t + 10s + r)$$

Hence the desired result is

$$9999(r - v) + 990(s - u)$$

For better understanding, let's take an example.

- Let the number be 75321.
- Reverse it, 12357.
- Subtract the reverse from the number i.e. $75321 - 12357 = 62964$.
- Reverse this number i.e. 49626.
- Add the answer and its reverse i.e. $62964 + 49626 = 112590$

Hence, it can be seen that the results i.e. extension and further extension for "The Magic of 1089" exists which have been proved mathematically (Aamir & Suhail, 2019).

4. Discussion

Mental mathematics has been the core of interest for years and many mathematicians have worked on its techniques. This research paper revolves around the techniques of the extension for the magic of 1089. In this paper, the researcher has worked at calculations to benefit the society. The researcher has examined the techniques in words, gave a mathematical reasoning followed by an illustration. This exploration was accomplished to provide something valuable to the mankind that will not only assist them in Mathematics but also in accelerating the reasoning process.

5. References

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