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Hidden Dimensions of the Null

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Abstract: *According to the literature, dividing by zero destroys the fabric of mathematics and the framework of logic and threatens to undermine the very basis of science. However, this study found that dividing by zero may not destroy the fabric of mathematics and the framework of logic in relative terms. We noted that 0 ÷ 0 = 2 and or 0.5, therefore, these findings advance the historically celebrated finding* $0^0 = 1$.

Keywords: *The Null*.

1. INTRODUCTION

The mysterious zero from [1] motivated the title of this study. The former study quoted that Brahmagupta tried to figure out what 0 ÷ 0 and 1 ÷ 0 were, and failed pp. 183. However, other possible alternative solutions of 0 ÷ 0 were ignored. For example, [2] noted that 0^x is either zero (if x > 0) or 1 (if x = 0) or ∞ (if x < 0). Most mathematicians agreed that $0^0 = 1$. Helpful in this regard whether 0 ÷ 0 = 1 or undefined, the reader is referred to [3]. Researchers interested in the binomial theorem

$$(x+y)^n = \sum_{k=0}^{n} \binom{n}{k} x^k y^{n-k}$$

to hold for at least one nonnegative integer n press $0^0 = 1$, so that x = 0 and y = 1 can be plugged in to get one on the left and 0^0 on the right [3].

Recently, a picture circulated through *facebook* was displaying a math related problem shown in equation 2, further motivated the desired work. Without the touch of inspiration (equation 1); the motivation for this work seems incomplete.

$$h.h = h^2 \tag{1}$$

To start with the post displayed on *facebook*, consider the following;

$$\frac{0}{0} = 2 \tag{2}$$

The post from the *facebook* proceeded with proof as follow;

$$\frac{(100-100)}{(100-100)} = 2 \tag{3}$$

The fourth step was equation 4;

$$\frac{(10^2-10^2)}{(10^2-10^2)} = 2 \tag{4}$$

Step 5 was apparently different as follows;

$$\frac{(10-10)(10+10)}{10(10-10)} = 2 \quad (5)$$

Operationalizing the tool of cancelation led to equation 6;

$$\frac{(10+10)}{10} = 2 \quad (6)$$

Referencing to *facebook*, in principle, may possibly have some reasons such as an open assignment. In addition, 0 ÷ 0 = 2 may be challenging students and researchers interested in the Null. 0 ÷ 0 = 2 could also solve mathematicians' puzzle-noted previously. Note that 0 ÷ 0 = 2 serve as an update over the historically celebrated finding 0 ÷ 0 = 1.

The Null seems to be an integral component in equations. See for instance the vast literature on Physics, Mathematics, Statistics, and Econometrics among other disciplines. Motivation for other relevant technical aspects stemmed out from the helpful works by [4], [5], [6], [7], and [8] plus other authors. Provided that the Null is not just a Null the Null is even more; this work is focused on contributing little to it is even more. The proposed study considered several steps to proceed by emphasizing representation given in equation 5 first. This representation seems apparently hard. Secondly, an alternative representation may likely lead to some other interesting results. Some of the results may serve well the challenging part-conclusion. Thirdly, consider an alternative representation of equation 5 as follows;

$$\frac{a^2-b^2}{c^2-d^2} = 2 \; where \; a = d; b = c; d = b; a = h \; \& \; h \neq h^2 \quad (7)$$

Equation number 7 can also be presented as follows;

$$\frac{(a-b)(a+b)}{(a^2-b^2)} = 2 \quad (8)$$

For facilitating the cancel operator, equation 8 turned out to be equation 9;

$$\frac{(a-b)(a+b)}{a(a-b)} = 2 \quad (9)$$

Now activate the cancel operator to get equation 10 as follows;

$$\frac{(a+b)}{a} = 2 \quad (10)$$

According to equation 7, equation 10 can be presented as follows;

$$\frac{(a+a)}{a} = 2 \quad (11)$$

Equation 11 implies;

$$\frac{(2a)}{a} = 2 \quad (12)$$

Fourthly, contributing little to it is even more than just a Null; the part little may possibly start from here. The equation number 12 implicitly implies another solution. According to some expert professors from research area, no question is right or wrong; the validity of a question makes a question right or wrong. Given this background, (0 ÷ 0 = 0.5?) apparently seems a valid question. And if not, consider the following representation of equation 8;

$$\frac{(a^2-b^2)}{(a-b)(a+b)} = 0.5 \quad (13)$$

After activating the equation 7, the next equation will likely take the following form;

$$\frac{a(a-b)}{(a-b)(a+b)} = 0.5 \quad (14)$$

Engaging the cancel tool may lead to the following equation;

$$\frac{a}{(a+b)} = 0.5 \quad (15)$$

According to equation 7;

$$\frac{a}{(a+a)} = 0.5 \quad (16)$$

Simplifying equation 16;

$$\frac{a}{(2a)} = 0.5 \quad (17)$$

Finally;

$$\frac{1}{2} = 0.5 \quad (18)$$

2. CONCLUSION

These seemingly naive results may offer some interesting implications. For instance, these results may imply the data generating process(s) of a number or numbers. As can be seen, numbers in the context of present study turned out to be 2 and 0.5. The explicit implication may call for data generating process(s) of other numbers on the numbers line. These data generating processes may lead to the extraction of information attached with numbers. Furthermore, functions may generate versatile outcomes by replacing $0^0 = 1$ with $0^0 = 2, 0.5$. Therefore, research along these lines may add to the alternative outcomes generating from various functions and may add to the choices faced by policy makers.

Limitations of this wok rely on several facts. Documentation of these facts demands on extended space, which in turn, may divert the focus. Sticking to the point, the literature has escaped closer looks on the works motivated by the data generating processes of numbers and $0^0 = 2$ and/or 0.5. Therefore, further research is needed in this ignored line of research.

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