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DEFINING THE UNDEFINED

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ABSTRACT

The value of infinity multiply by zero is one of the most mysterious calculation. Here we will find the standard value of infinity multiply by zero.

INTRODUCTION

Generally, the meaning of '0' (zero) is considered as something that is 'nil' and '∞' (infinity) as something that is 'never ending' and also -1, -2 with the same meaning as '0'. As an example we can say that having zero (0) money means having no money and it also can be said literally when we say having -10(minus ten) money means no money. But here we will use 0 (zero) not as 'nil' but as a value also ∞ (infinity) as a value which is the inverse of 0 i.e. '1/0' or '0⁻¹'. When zero is multiplied by anything (infinity excluded), you get zero and when infinity is multiplied by anything (zero excluded), you get infinity. So, in this paper we will find the product of these two numbers i.e. zero and infinity.

Main Results

In the past Euler thesis states that

$$\infty * 0 = n$$

Where n is every number.

So now, we state that the standard value of ∞*0 is 1.

Now, let's prove the above statement

Proof 1:

The standard value or simplest value of every number's denominator is 1 i.e. $\frac{4}{2} = \frac{2}{1}$, $\frac{-10}{-1} = \frac{10}{1}$ etc also $0 = \frac{0}{1}$. So, in 0, we

can write zero as $\frac{0}{2}$ or $\frac{0}{9}$ or $\frac{0}{999}$ etc but in standard we considered the denominator of 0(zero) as 1. So, with reference to that the standard value of ∞ is $\frac{1}{0}$ not $\frac{2}{0}$ or $\frac{99}{0}$ etc as zero is the inverse of infinity. In algebra, combinatorics, or set theory, the generally agreed upon value is $0^0 = 1^{[1]}$. So,

$$\begin{aligned} 0^0 &= 0^{1-1} \\ &= 0^1 * 0^{-1} \\ \text{i.e. } 0 * \infty &= 1 \end{aligned}$$

Proof 2:

$$\frac{0}{0} = 1$$

By Antonio Luigi Paolilli (2017) ^[2]

$$\text{Now, } \frac{0}{0} = 1$$

$$\frac{0}{0} * \frac{1}{1} = 1$$

$$\frac{0 * 1}{1 * 0} = 1$$

$$\frac{0}{1} * \frac{1}{0} = 1$$

$$0 * \infty = 1$$

Proof 3:

By the trigonometric value of angle,

$$\text{Cos } 90^\circ * \tan 90^\circ$$

$$= \text{Cos } 90^\circ * \frac{\sin 90^\circ}{\cos 90^\circ}$$

$$= \sin 90^\circ$$

$$\text{i.e. Cos } 90^\circ = 0$$

$$\text{Tan } 90^\circ = \infty$$

$$\text{Sin } 90^\circ = 1$$

$$\therefore 0 * \infty = 1$$

Similarly,

$$\text{Cot } 90^\circ * \sec 90^\circ = \frac{1}{\sin 90^\circ}$$

$$\text{Tan } 0^\circ * \text{cosec } 0^\circ = \frac{1}{\cos 0^\circ}$$

$$\text{Sin } 0^\circ * \cot 0^\circ = \cos 0^\circ$$

DISCUSSION AND CONCLUSION

The following conclusions can be drawn from the material presented in this paper:

- The standard value of $0 * \infty$ is 1.
- All the research that had been discontinued due to getting $0 * \infty$ which previously kept as undefined in many fields such as physics, mathematics etc can now be continued as we define the undefined.
- Other than the research, the unsolved part of mathematics in our daily life can now be calculated without any issue.

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