Definition of Zero and Infinity to solve dividing by zero and managing infinity.

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Abstract :

This paper redefines the definition of cardinality in a more details manner. Similar to cantor's work but it has more definitions on the types of infinities.

This allows the solution to some of the indeterminate forms.

And gets rid of some of the paradoxes created via not defining the various types of infinity.

When I was in class 8 I was thinking about infinite points in a line. Then infinite lines in a plane.
If I divided the points with the number of lines in a plane, then I was getting one point per line.
So I thought for many days about how to define it “correctly.”
Then I came up with infinity being the number of points between the number 0 and 1 in a line.
This included the point on the number 1. It became the points from (0..1] then the next infinite points became (1..2] skipping the point located exactly on 1.
So the number of points on a line bacame (2 (infinity) + 1). The +1 representing the point located on zero. 2 x infinity because the number line went to positive and negative directions.
There are some cases where the theoritical physicists need to divide by zero or infinity. The sometimes are not sure when to divide and when not to.

There are many types of infinities. So the one I am defining shall be called I (Capital letter I). Zero shall be denoted with Z (Capital Z).
I is one of the infinities from all the various infinities. And Z is one of the many zeros.
To define this Z and I correctly, I needed to define it in some other term than zero and infinity.
So I tried and after many years was able to do so. I learned about limits in Class 11 and in a few years I was able to define Z and I in terms of something else.
I selected the number 1 to define and tried many ways to avoid using a zero and infinity.
This is the magic formula I finally arrived at.

Z = limit (1 / 1 – x) where x approaches 1.

This Z shall be the size of one point on the number line.
So the number of points from (0..1] = I
I = 1 / Z
Number of points on a line = $2(I)^2 + 1$
Number of points on a plane = $(2(I)^2 + 1)^2$
Number of points in 3D space = $(2(I)^2 + 1)^3$

Finally you can divide by zero and multiply by infinity. You just need to select the correct zero or infinity based on my definition before doing so.

So 1 / Z = I

$(1 / Z)^2 = I^2$
This shall explain why some limits converge and some diverge.

A famous mathematician named George Cantor tried to convert these number into a concept of cardinality.

In simplified terms.

The number of natural numbers = I. Without the Zero.

Number of integers = 2I + 1 (Including the zero)

Number of fractions with integers in numerator and denominator =
$(2I + 1)^2$

This means the number of fractions are equal to the number of

Number of real numbers based on base 10. I numbers on both sides of the decimal point = $(10)^{(2I+1).}$ That is a lot of real numbers.

Number of real numbers based on base 2 (binary).
I numbers on both sides of the decimal point = $(2)^{(2I+1).}$
That is a lot of real numbers.
So according to my method, the number of base 10 real numbers is a LOT more than binary real numbers.

The great thing about this method compared to the existing attempts at managing infinity is that it can create a small number when dividing or multiplying by infinity or zero.

Here are some examples.

2I / I = 2

1 / Z = I
2 / Z = 2I

This you gotta see.

I / I = 1
Z / Z = 1

The last two lines shall solve a lot of issues in maths.

From Wikipedia http://en.wikipedia.org/wiki/Indeterminate_forms
“In calculus and other branches of mathematical analysis, limits involving algebraic operations are often performed by replacing subexpressions by their limits; if the expression obtained after this substitution does not give enough information to determine the original limit, it is known as an **indeterminate form**.”

The most common indeterminate forms are denoted 0/0, ∞/∞, 0 × ∞, 0^0, ∞ − ∞, 1^∞ and ∞^0.

These indeterminate forms are solved by my method as follows :
Z/Z = 1
I/I = 1
Z x I = 1
$Z^0 = 1$
I – I = Z
$1^I = 1$
$I^0 = 1$

Some more to clarify
I – 2(I) = -I
I / Z = I x I
Z / I = Z x Z = Z^2
I x Z = 1 = One.

If you really want to know about a larger number then the normal infinities, then ask me for my definitions of the “Infinital” and “Beyond Infinital.”

An example is the issue of solving the following

$$\lim_{x \to 4} \frac{x^2 - 16}{x - 4} \qquad \lim_{x \to \infty} \frac{4x^2 - 5x}{1 - 3x^2}$$

In my system, the first one looks like
(-Z^2)/(Z) which means the limit of the first is -Z = Negative zero.

For the second looks like
(4(I^2) – 5I) / (1-3(I^2)) which is close to 4(I^2) / -3(I^2).
So the limit for the second is 4/-3 = negative 4/3