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one = zero

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In this paper, I use Mathematics in addition to the three most pure sciences — Physics, Chemistry, and Rap — to prove that $1 = 0$. The argument uses The Ideal Gas Law, Ohm's Law, the Definitions of Power and Velocity in addition to indefinite integrals, simple mathematical operations, and the 99 Problems Law. This intuition-crushing result can be applied to all branches of mathematics and sciences and will likely go down as one of the greatest discoveries of all time.[1]

1. Introduction

For years, humans walked on all fours. For years, humans believed the world was flat. For years, humans managed to go through their days without the aid of omnipotent smartphones. We believe those days are behind us. They're called the Dark Ages. But can we ever really escape the clouded reality of the Dark Ages and arrive at an understanding of the purity that defines our universe?

For years, mathematicians have accepted that the additive and multiplicative identities of any ordered field are distinct values. They write many convincing proofs, yet their findings are those of the past.

It's time for us to exit the Dark Ages. With some intuition and lots of equations, we will stand on the shoulders of geniuses before us and reach even greater heights.

[1] Up there with "The Empire Strikes Back" when Luke discovered Darth Vader was his father. That was dope.

2. The Proof

We begin by setting 1 equal to the variable x.

$$1 = x. \tag{1}$$

It is trivial that $1 = one$, so we can substitute into the equation and get:

$$one = x. \tag{2}$$

We then use the Ideal Gas Law, first stated by Emile Clapeyron when he combined the ideas of Boyles, Charles, and Avogadro. The Ideal Gas Law is a pillar of Chemistry, relating pressure, volume, temperature, and the amount of a substance. It is written:

$$PV = nRT. \tag{3}$$

We solve for n and substitute into equation (2) to get:

$$oe\frac{PV}{RT} = x.$$

Note that all throughout we are assuming our quantities commute.

We then turn from Chemistry to Physics, specifically to electricity and conductors. Georg Ohm measured that current is directly proportional to voltage and inversely proportional to resistance. Ohm's Law states:

$$i = \frac{V}{R}. \tag{4}$$

We substitute for $\frac{V}{R}$ and get:

$$oei\frac{P}{T} = x. \tag{5}$$

Sticking with Physics, we define Power as the amount of Energy consumed over an amount of Time. From this definition, we get the equation:

$$P = \frac{W}{T}. \tag{6}$$

We then substitute for P and get:

$$oei\frac{W}{T^2} = x. \tag{7}$$

Figure 1: Ohm realizes his first name needs another "e".

Using Physics yet again, we define Work as a Force times the Distance it travels to give us the equation:

$$W = F \cdot d. \tag{8}$$

We substitute for W and get:

$$oei\frac{Fd}{T^2} = x. \tag{9}$$

Leaning on Physics again,[2] we define Velocity as Distance over Time, given by the following equation:

$$V = \frac{d}{T}. \tag{10}$$

We then substitute for $\frac{d}{T}$ and get:

$$oei\frac{VF}{T} = x. \tag{11}$$

We then switch from the purest form of science to the purest discipline imaginable. Mathematicians had no way of accounting for the square roots of negative numbers until Leonhard Euler and Carl Friedrich Gauss popularized the notion of i as the imaginary number. We use the definition of i as follows:

$$i^2 = -1. \tag{12}$$

[2] I'm sensing a trend here. Maybe we've discovered the most relevant field of science...

We divide both sides of the equation by $i^2 = -1$ and get the following:

$$oe\frac{V}{i}\frac{F}{T} = -x. \tag{13}$$

We then return to Ohm's Law and substitute for $\frac{V}{i}$. This yields:

$$oer\frac{F}{T} = -x. \tag{14}$$

In math, we love multiplying things by silly forms of 1.[3] For this proof, our funny 1 is $\frac{d}{d}$, which we multiply to the left side of equation (14) to get:

$$oer\frac{dF}{dT} = -x. \tag{15}$$

Calculus Time! As any Physics Theorist will tell you, the derivative of Force with respect to Time is equivalent to that of Acceleration with respect to Time because $F = ma$ where m is merely a constant.[4] The derivative of Acceleration with respect to Time is less known than its counterparts Position, Velocity, and Acceleration;[5] because of this, it has developed a mean streak, as evidenced by its name Jerk. Jerk is calculated in the equation below:

$$\frac{dF}{dT} = J. \tag{16}$$

We then substitute for $\frac{dF}{dT}$ and get:

$$oerJ = -x. \tag{17}$$

We then pull another classic math punch by multiplying each side of the equation by the same thing, a special thing that helps us achieve the result we desire. In this case, we use $2dx$ and get:

$$2oerJ(dx) = -2x(dx). \tag{18}$$

[3]Maybe that explains our inability to change. Why do we use outdated things like π and base 10 anyway instead of their superior doppelgangers τ and base 12?

[4]Shhhh. Don't tell the Mechanical Engineers.

[5]Possibly even less known than Snap, Crackle, and Pop, which are the fourth, fifth, and sixth derivatives of Position, in addition to being the Rice Krispies' mascot trio.

Calculus Time Part 2! We integrate both sides of the equation

$$\int 2oerJ(dx) = \int -2x(dx) \tag{19}$$

and get:

$$2oerJx = \frac{-2x^2}{2} + C = -x^2 + C. \tag{20}$$

I know what you're thinking. Why is there only one constant when we just integrated two indefinite integrals? Great question. There are technically two constants, but we only need one because it quantifies the difference between the two indefinite integrals. We use equation (1) ($x = 1$) and substitute for x to get:

$$2oerJ = -1 + C. \tag{21}$$

The Romans gave us some cool stuff - calenders, roads, etc. One of the sweet things they gave us was an efficient number system, which you probably know as the Roman Numerals. One of the Roman Numerals is C which represents 100, as shown in the following equation:

$$C = 100. \tag{22}$$

We substitute for C and get:

$$2oerJ = 99. \tag{23}$$

We finally reach the third pure science: rap. Rapper Jay Z is famous for his hit "99 Problems". He is a man named Jay Z with 99 problems, so the following conclusion follows trivially:

$$JZ = 99. \tag{24}$$

This means $\frac{99}{J} = Z$, and by substitution we have:

$$2oer = Z. \tag{25}$$

We then reorganize the equation and get:

$$Z^{-1}ero = \frac{1}{2}. \tag{26}$$

Let us pause here for a Lemma that will help complete the proof.[6]

[6] mathematician:lemma::skydiver:parachute

Figure 2: 99 Problems But Proofs Ain't One.

2.1. Lemma

Goal: $Z = Z^{-1}$.

Proof: For proof by contradiction, assume $Z \neq \frac{1}{Z}$.

$$Z \neq \frac{1}{Z}.$$

$$Z^2 \neq 1.$$

$$Z^2 - 1 \neq 0.$$

$$(Z+1)(Z-1) \neq 0.$$

$$Z \neq 1, Z \neq -1.$$

This is a contradiction because Z generally represents the Z-Score of a data point within a distribution. There is a 68.2% chance that a data point has a Z-Score between -1 and 1, which shows that it is a clear possibility to be at either endpoint. With our desired contradiction, we conclude:

$$Z = Z^{-1}. \tag{27}$$

2.2. The Finale

Using the Lemma in the form of equation (27), we substitute into equation (26) for Z^{-1} and get:

$$Zero = 1/2. \tag{28}$$

Similar to $1 = one$, it is trivial that:

$$Zero = 0. \tag{29}$$

We then substitute into equation (28) and get:

$$0 = 1/2. \tag{30}$$

We then multiply both sides of the equation by 2 and get:

$$0 = 1 \tag{31}$$

as required. Hence, we have shown that $0 = 1$. QED

3. Conclusion

We have just shown that $0 = 1$. The applications of this breakthrough are immeasurable. There's a lot of talk about uniting different disciplines through massive discoveries. My feeling is that this proof will live on as a testament to the ability to bring together seemingly unrelated strands of human knowledge and achieve something wonderful. Sure, it might not be the most elegant proof around, but its conclusion relates the additive and multiplicative identities in a way previously believed to be impossible.

Intuition tells me there might be a generalization of this theorem. It's possible we could treat $0 = 1$ as a base case and use induction to prove that $0 = k+1$ for all natural numbers k. This would in turn prove that every natural number is actually equal to 0.

Regardless of whether this generalization is true, this proof is enough to foreshadow another Golden Age of academia. Maybe we really are moving beyond the Dark Ages.[7]

[7] Editor's note: Images used in this article were obtained through `Wikipedia`. The image in Figure 1 is a public domain image from https://en.wikipedia.org/wiki/Georg_Ohm. The image in Figure 2 belongs to Joella Marano from Manhattan, NY, and is made available under CC BY-SA 3.0 license at https://en.wikipedia.org/wiki/Jay_Z.