# There is only one

A zine for those who want to become one with one.

“One One” was a racehorse,
“One Two” was one too.
“One One” won one race.
12112

# 1 Motivation

In their 1985 single, "One Vision", the British rock band *Queen* outlined the following research program:

> So give me your hands, give me your hearts
> I'm ready!
> There's only one direction
> One world and one nation
> Yeah, one vision
>
> – Queen, "One Vision"

# 1 Foundations

**Definition 1.1.** For anyone,

$$1 + 1 = 1$$

$$1 - 1 = 1$$

$$1 \div 1 = 1$$

$$1 \times 1 = 1$$

There is only one function, and it is 1-to-1.

$$f(1) = 1$$

and one relation: $1 = 1$

# 1 Calculus

**Theorem 1.1.** *Every sequence converges.*

*Proof.* Consider a sequence: $1, 1, \ldots$. $\forall \varepsilon = 1$, we have:

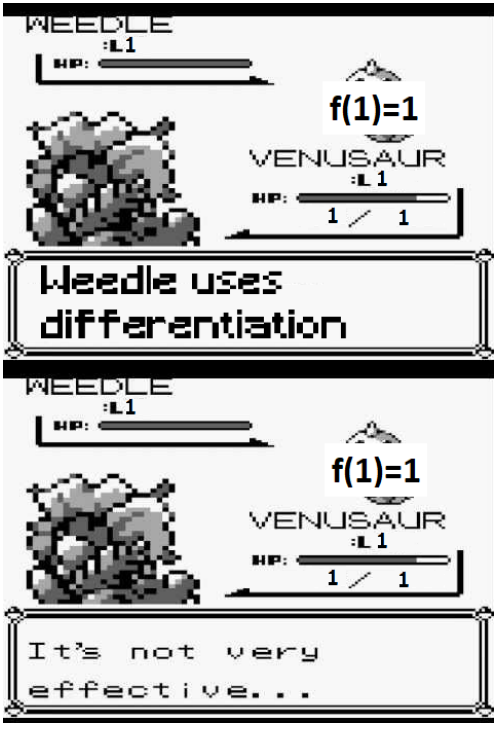
$$|1 - 1| = |1| = 1 = \varepsilon$$

□

**Corollary 1.1.** *Every series converges.*

This is left as an exercise to the reader.

# 1 Derivatives




$$f'(1) = \lim_{h \to 1} \frac{f(h) - f(1)}{h - 1} = 1$$

# 1 Topology and Geometry

Here is a true statement:

$$\text{There exist manifolds, } M^m \text{ and } N^n \text{ with } n > m, \text{ but } N = M \setminus \{*\}$$

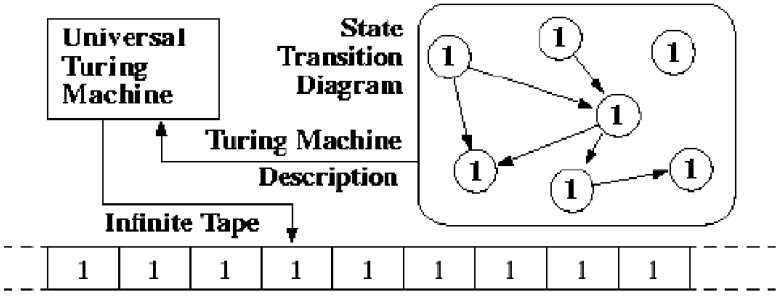
**Q:** What do you call an empty manifold?
**A:** Pointless.

Here is another true statement

$$\text{There is only one set: } \{1\}.$$

# 1 Complexity

One makes computers more efficient if one removes the useless 0's between the 1's. Here's a turing machine:




**Corollary 1.1.** *The halting problem is solvable.*

*Proof.* Halt at 1. □

# 1 Algebra

There is only one group. Hey look! It's your friend group!

You

•

The one ring.

Did you miss it?

Sauron sure did.

# 1 The Riemann Hypothesis

Consider the function:

$$\zeta(s) = \sum \frac{1}{n^s}$$

we wish to find places where

$$\zeta(s) = 1$$

Plug in $s = 1$, and we're done.

This has many application in the distribution of the single prime number, 1.

# 1 P vs. NP

One provides a solution to the Boolean satisfiability problem.

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True=1, False=1
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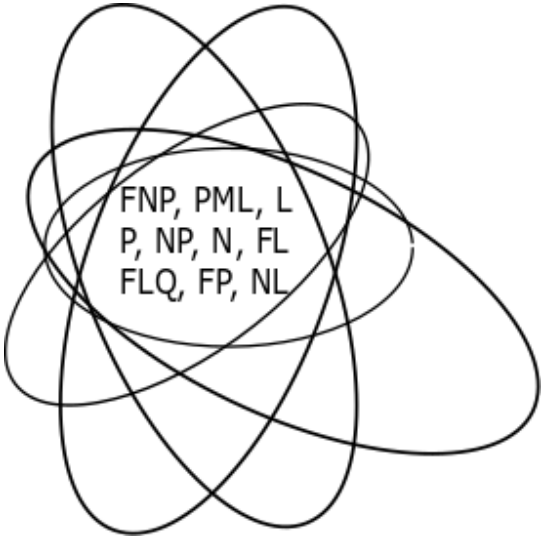
One verifies the satisfiability of any formula in $O(1)$ time.



# 1 Navier Stokes

$$\rho \frac{DV}{Dt} = -\nabla p + \nabla \cdot \tau + \rho g$$

Wow, this simplifies greatly[1]

$$1 \frac{Df}{D1} = -\nabla 1 + \nabla \cdot 1 + 1$$

In particular, the solution $f(1) = 1$ is smooth, and works in sub- or super-critical spaces.

[1] see Section 1 for more details

# 1 BSD Conjecture

Dear reader,

I'll be perfectly honest with you, and tell you outright that I have no idea what the BSD conjecture even talks about.

All I know that it holds true over the field with one element, and that's all that's important.

Sincerely,

– Assaf Bar-Natan

# 1 Yang-Mills Mass Gap

We wish to prove that for any compact simple gauge group $G$, a non-trivial quantum Yang-Mills theory exists on $\mathbb{R}^1$ and has a mass gap $\Delta > 0$. Unfortunately, there is only one quantum Yang-Mills theory on $\mathbb{R}^1$, and it is trivial.

# 1 Poincaré Conjecture

Let $M$ be a manifold. Then $M = \{1\}$. So:

**Theorem 1.1.** *There is only one manifold, and it is isomorphic to itself.*

The Poincaré conjecture immediately follows.

One could also use some Ricci Flow with surgery.

# 1 Hodge Conjecture

Let $M$ be a complex Kähler manifold, with cohomology ring:

$$H^1(M,1) = \bigoplus_{1+1=1}^{1} H^{1,1}(M) = 1$$

$N \subseteq M$ is algebraic[1], so

**Theorem 1.1.** *All cohomology classes in $H^{1,1}(M)$ come from subvarieties.*

[1] It's a solution to the polynomial equation $1 = 1$

# 1 Bonus!

# Collatz Conjecture

Proof by picture: