

*solutions in the origins of math*

## *The Goldbach Conjecture*

**prime** i define as Goldbach did - what Euler & our recent math deny:

**prime**<sub>def 1</sub> = **a product of only 1 and itself.**

the **a**, **only**, **1** and **itself** each imply **primacy**. the four refract **prime** into unity.

notice that by **prime**<sub>def 1</sub>, 1 is prime.

1 is **the exemplar prime**.

all agree **1 is unique**:

- Euclid agreed by *denying it numberhood* and calling it **the Unit**: that which any Number is a multitude of.
- Euler agreed by *denying it primacy*, and thereby spoke a paradox:

"I deny the primacy of 1."

if rather defined as

**prime**<sub>def 2</sub> = a number with only two distinct divisors

then 1 is not prime, since 1 has only **one distinct divisor**: 1.

i'd amend **prime**<sub>def 2</sub> to:

**prime**<sub>def 1.i</sub> = a number whose only divisors are 1 and itself

by **prime**<sub>def 1</sub> or **prime**<sub>def 1.i</sub>, **the Goldbach Conjecture** resolves to:

**every even number is a sum of two primes.**

if a **Goldbach number** is a sum of two primes, then **the Goldbach conjecture** is these seven words:

**every even number is a Goldbach number.**

1 is **the common factor**, the unit all numbers are built from. the Fundamental Theorem of Arithmetic is odd without it.

if primes are "the basic building blocks of all numbers"<sup>1</sup>, then 1 is **the exemplar prime**: the primes are all *like* 1.

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<sup>1</sup> mathisfun.com : Fundamental Theorem of Arithmetic

if 1 is prime, we simplify the FTA,

from

**every integer greater than 1 is either a prime or the product of primes**

to

**every natural number is a product of primes**

i.e. every non-prime is a product of primes, and every prime is a product of itself & its exemplar.<sup>2</sup>

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<sup>2</sup> what about the FTA's **unique factorization** claim? on granting 1 primacy, we add two symbols to the FTA corollary [ **1<** ] : which i rather like. see Chris K. Caldwell & Yeng Xiong, **What is the Smallest Prime?** Journal of Integer Sequences, 2012 [Vol 15]



Recent espousers of 1's primacy include G.H. Hardy and the aliens in Carl Sagan's **Contact**.

it's the first thing the aliens say: their opening VHOOMP is a correction of our Math.

odd how **Goldbach**, **Gödel/Bach**, and **Goldberg-Bach** imply the other aurally & in my limited list of Aufklärer - how music & a kinderlogic affirm the self-reference i'd restore the first word of Math to; and how lovely Rebecca **Goldstein** is, who elicits by a footnote in her Gödel book this Sunday morning exercise.<sup>3</sup>

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<sup>3</sup> Rebecca Goldstein, **Incompleteness: The Proof and Paradox of Kurt Gödel**. Norton, 2006

she lets me know the Vienna Circle's favorite word, **sachlichkeit**, means "fact-mindedness". her beauty demands we let in song, when analyzing.

1 is **prime's exemplar**. 1 is **prime's namesake**. i assert **the primacy of 1**. i sum again to solve as Goldbach intended; and up the reductivist structure, levels 4 thru 20 of the Sick Kids research tower, i'd free the mouse from rack & decapitator.

Grothendieck had a flair for choosing striking, evocative names for new concepts; indeed, he saw the act of naming mathematical objects as an integral part of their discovery, as a way to grasp them even before they have been entirely understood.<sup>4</sup>

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<sup>4</sup> Allyn Jackson, **Comme Appelé du Néant—As If Summoned from the Void: The Life of Alexandre Grothendieck**. Notices of the AMS 51:10, p 1197

for Bob Palais, it's not that the **circumference/diameter** ratio *isn't* 3.14 - it's that we should have saved the special name for **6.28**, for the **circumference/radius** ratio.

Palais complains of "the litany of important theorems and formulas into which a ubiquitous factor of 2 has crept and propagated". he advocates "good notational conventions."<sup>5</sup>

radius gives the circle simply: diameter *reduces* to two continuous radii.

a point on a plane, evenly radiating: this is what a circle *is*!

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<sup>5</sup> Bob Palais,  **$\pi$  Is Wrong!** The Mathematical Intelligencer, 2001 [vol 23:3]

## *The Liar's Paradox*

One of themselves, even a prophet of their own, said, the Cretans are always liars, evil beasts, slow bellies.

This witness is true. Wherefore rebuke them sharply, that they may be sound in the faith

[Titus 1:12-13]

### **solution 1a**

the prophet disclaims from the vantage of banishment. when Paul/pseudo-Paul [**P/p-P**] comes upon him, he's exiting Crete, with the weight of the Cretans' judgement on him.

some of that weight he offloads to **P/p-P**, and **P/p-P** onto Logical history.

### **solution 1b**

they've just killed their Socrates, and the prophet escapes with his life - he shall not let them sin against Philosophy twice.

### **solution 1c**

the prophet speaks from the standpoint of their future Redemption: all Cretans *at Paul's present* are liars.

: in **solution 1**, the prophet isn't *strictly* "one of their own".



## **solution 2**

**P/p-P** insists that the Cretan "is true". perhaps **P/p-P** means that the flip-flopping Implication [**if he's true then he lies; if he lies then he's true**, and so on] sums into **he's true**, in logical space: it's **a rounded sum of competing infinities**.

### **solution 3**

are *you* a true witness, **P/p-P**? that depends on *who you are*, Paul or pseudo- : for it's **Paul** you claim in the byline:

Paul, a servant of God, and an apostle of Jesus Christ, according to the faith of God's elect, and the acknowledging of the truth which is after godliness

[Titus 1:1]

scholars approach consensus that the Pastoral Epistles are pseudonymous.

i for one am wary of a writer who begins with *Trust me*;

so the Paradox displaces to **Titus 1:1** itself, to **the document's** authenticity.

this Paradox is nested in witnesses. in orbitals our answers displace to. the [putative] Cretan's [putative] words we circle in our recursion. we widen from the site of speech, we de-indent from the Dialogue's inner column to interrogate its Witness, then the Citer, and so on.

The speaker, Epimenides, is a Cretan.

who says *this*, and why do we believe them?

## *Russell's Paradox*

does **the set of all self-exclusional sets** exclude itself?

it seems to me that Russell's decree - **Whatever involves *all* of a collection mustn't be *part* of the collection** - is not wholly arbitrary.

**a self-inclusional set** is *quasi*-contradictory: "a kind of vicious circle", he says.

the **quasi** is his opening: it frees him from perplexity to resolution, action.

his Theory of Types is folly, some said. an ad hoc pencil trick to save all Arithmetic.

yet *something* must be done to stave off logical collapse!

the lemmas must be pried apart & quarantined: as Yahweh parted  
Sea from earthly Promontory.



Yahweh tells Job: your pious thought, your Math alone, cannot make a World. a World must be *willed* into coherence.

it's a lonely achievement, a terrible secret, that Yahweh confesses.

the people sleep easy, unknowing their existence is deeply contingent: that **consistency *itself* is contingent** on a primal volition!

A.J. Ayer briefly died and found himself squinting at a dire red light, a siren impelling him to fix some kind of rift in the structure of Time.

in a ground-level lab where cyberspace gestates, a toggle-switch is stuck with gum to perpetual ON - with "MAGIC" written on the masking tape label.

they've let in something senseless. their *need* is what demands it. their irony - a leavening in their Naturalism - allows it.

you're at the gates of Night & Day, the Paradox all & anything stream from.

& what did Earl Russell do? a Hierarchy, he decreed: a ranking of Types, to let in the light.

he *decreed*, not quite *deduced*. yet it's sensible, in its way: for by it we ascend thru levels of increasing generality.