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Geometric Prime Conjecture Part I:

The Martini Glass Conjecture on Twin Prime Midpoints

1.0 Abstract

Twin prime midpoints, when expressed as integers, exhibit systematic alignment along well-defined geometric axes.

These axes impose numeric constraints on structures assembled from both twin prime midpoints (MT) and prime pair midpoints (MP) higher up the integer number line.

Computational tests consecutive for prime gaps up to 100_000_000 indicate that their occurrence is not random but constrained by deeper field symmetries.

2.0 Glossary of Terms

Twin primes (TP): pairs of primes separated by exactly 2, i.e. (p, p+2)

Prime pairs (PP): pairs of primes separated by any even distance n, i.e. (p, p+n).

Midpoints (M): the integer average between two primes.

- For twins: (p+1), always even.
- For pairs: (p+(p+n))/2.

3.0 Special notation in this conjecture

MT (Midpoint of Twin): the midpoint of a twin prime pair.

PTL / PTH: the low/high primes of a twin pair.

MP (Midpoint of Pair): the midpoint of a prime pair with gap Delta.

Δ (Delta): the separation between the primes of a pair.

PML / PMH: the lower and higher members of the symmetric pair associated with MP

4.0 The Conjecture

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The midpoint (MP) between consecutive primes is always divisible by a twin prime midpoint (MT), **unless**

1. the midpoint itself is a twin prime midpoint, or
2. the prime gap Δ is itself a twin midpoint or a multiple of a twin midpoint.

5.0 Evidence and Observations

Computational results:

- Verified for primes up to 100_000_000 using streaming prime generation (gmpy2).
- No counterexamples found; all tested midpoints satisfied the conjecture.
- Exceptions at Delta=2,4,6 are accounted for by definition (twin primes or multiples of twin midpoints).

6.0 Figures and Explanitory Notes

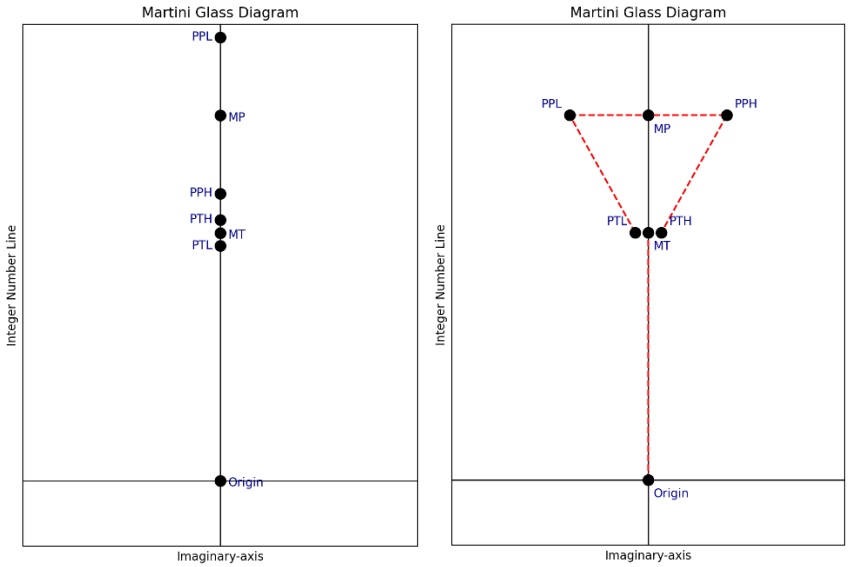

Figure 1. Stylised Martini Glass Diagram illustrating the conjecture.
To visualise the conjecture, we show a rotation of the prime pair line PPH–PPL by 90° about MP, followed by a rotation of the twin prime line PTL–PTH about MT. This operation yields a geometric representation of the four primes in the set. For qualifying cases, the length of the stem of the glass (integer value of MT) is always an exact divisor of the

height of the glass (integer value of MP).
This schematic is not to scale but conveys the underlying geometric structure of the conjecture.

7.0 Experimental Verification

We invite independent researchers to test the conjecture by testing midpoint divisibility patterns at larger bounds.

8.0 Code and Resources

Code and further resources available at https://davefield.org