Prime Number Pattern Associated with Icositetragons

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ABSTRACT

When integers are continuously plotted around each side of an icositetragon (24-sided polygon), patterns of primes and a new classification of prime numbers (Quasi-primes) emerge.

SUMMARY

With the exception of only 2 and 3, prime numbers arrange uniformly within modulus 1, 5, 7, 11, 13, 17, 19, and 23 (See Figures 1-2). This orientation of primes only appearing within prime moduli is a pattern that continues to infinity (See Results).

Quasi-Prime "Q-prime" numbers are newly defined as numbers that are products of primes ≥5. Q-primes will always have either prime or product of prime factors (defined in table below for the first 360 integers). Like prime numbers, Q-prime numbers arrange uniformly on modulus 1, 5, 7, 11, 13, 17, 19, and 23 into infinity (See Figure 3).

Prime numbers squared "prime squared" are defined as products of prime numbers ≥5, squared (eg 25 (5^2), 49 (7^2), etc.). These appear only in modulus 1, a pattern that is also hypothesized to continue infinitum (See Figures 4-5). More research is required to obtain further knowledge from or about these patterns.

RESULTS

35: 1, 5, 7	**133:** 1,7,19	**221:** 1,13,17	**299:** 1,13,23
55: 1, 5, 11	**143:** 1,11,13	**235:** 1,5,47	**301:** 1,7,43
65: 1, 5, 13	**145:** 1,5,29	**245:** 1,5,7,35,49	**305:** 1,5,61
77: 1, 7, 11	**175:** 1,5,7,25,35	**247:** 1,13,19	**319:** 1,11,29
85: 1, 5, 17	**185:** 1,5,37	**253:** 1,11,23	**323:** 1,17,19
91: 1, 7, 13	**187:** 1,11,17	**259:** 1,7,37	**325:** 1,5,13,25,65
95: 1, 5, 19	**203:** 1,7,29	**265:** 1,5,53	**329:** 1,7,47
115: 1,5,23	**205:** 1,5,41	**275:** 1,5,11,25,55	**335:** 1,5,67
119: 1,7,17	**209:** 1,11,19	**287:** 1,7,41	**341:** 1,11,31
125: 1,5,25	**215:** 1,5,43	**295:** 1,5,59	**343:** 1,7,49
	217: 1,7,31		**355:** 1,5,71

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...Modulus 23   Modulus 24   Modulus 1   Modulus 2...
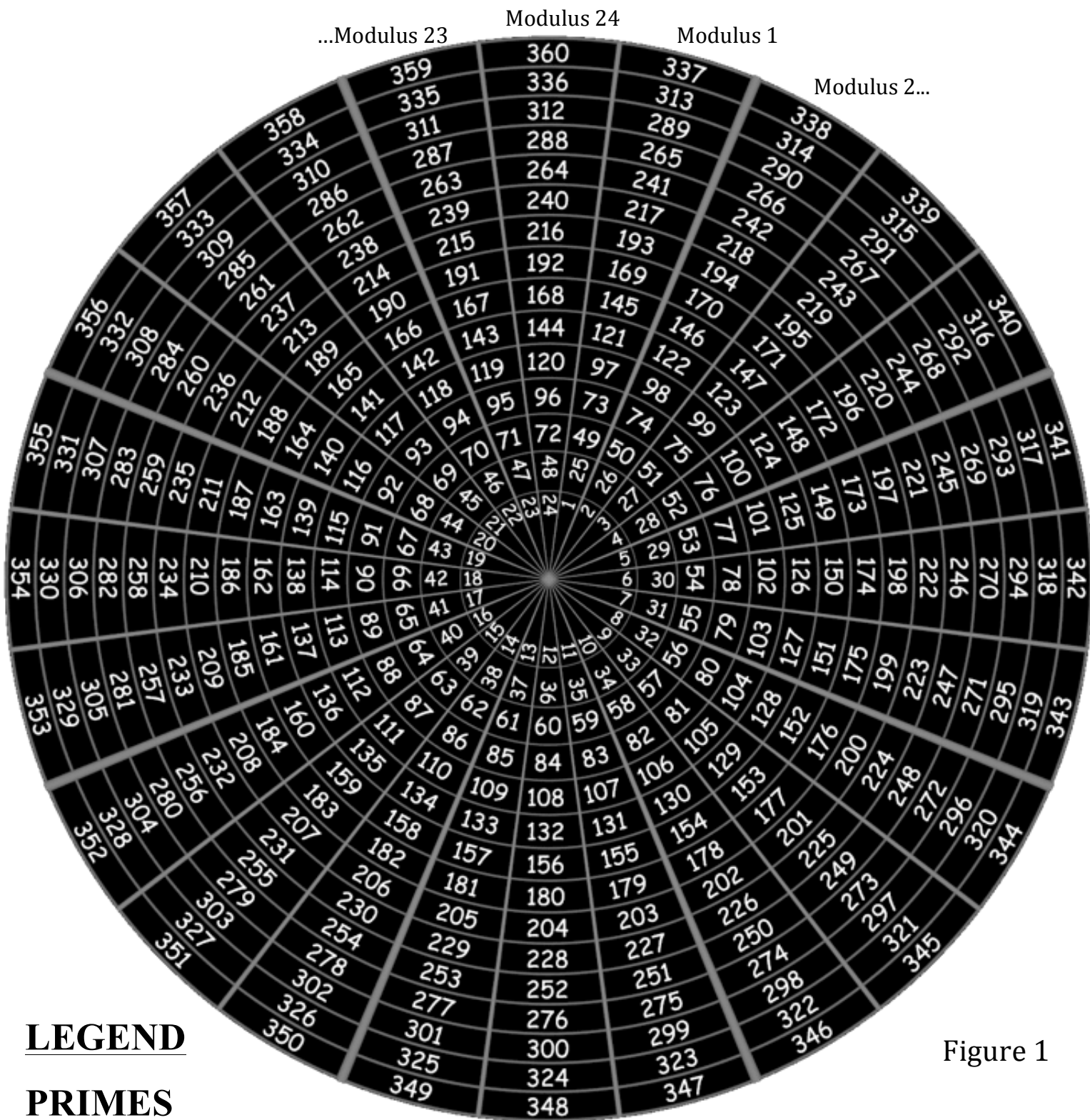
Figure 1

LEGEND

PRIMES

Q-PRIMES

PRIMES^2

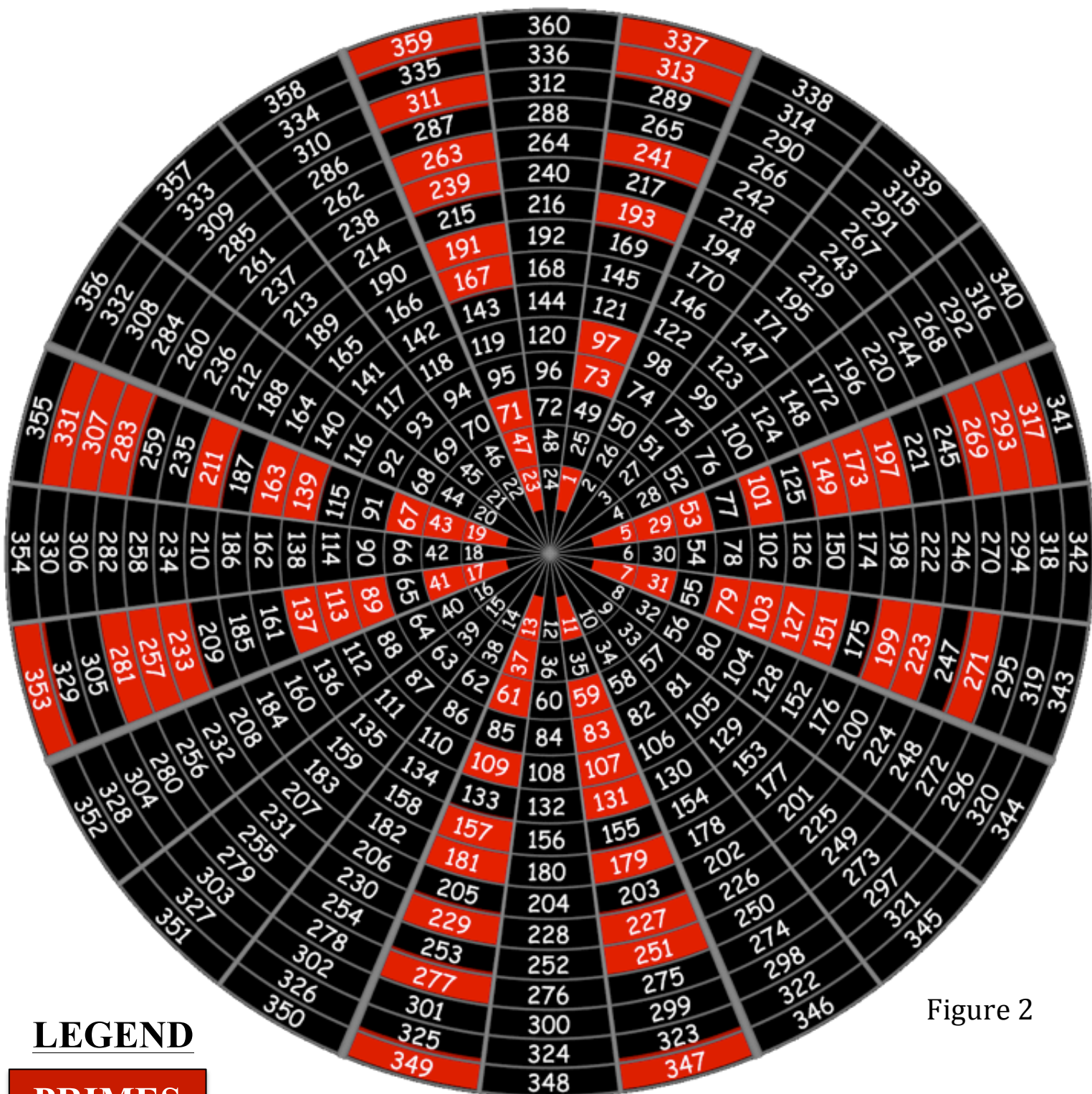Icositetragon filled in up to 15 cycles…

Figure 2

LEGEND

PRIMES

Q-PRIMES

PRIMES^2

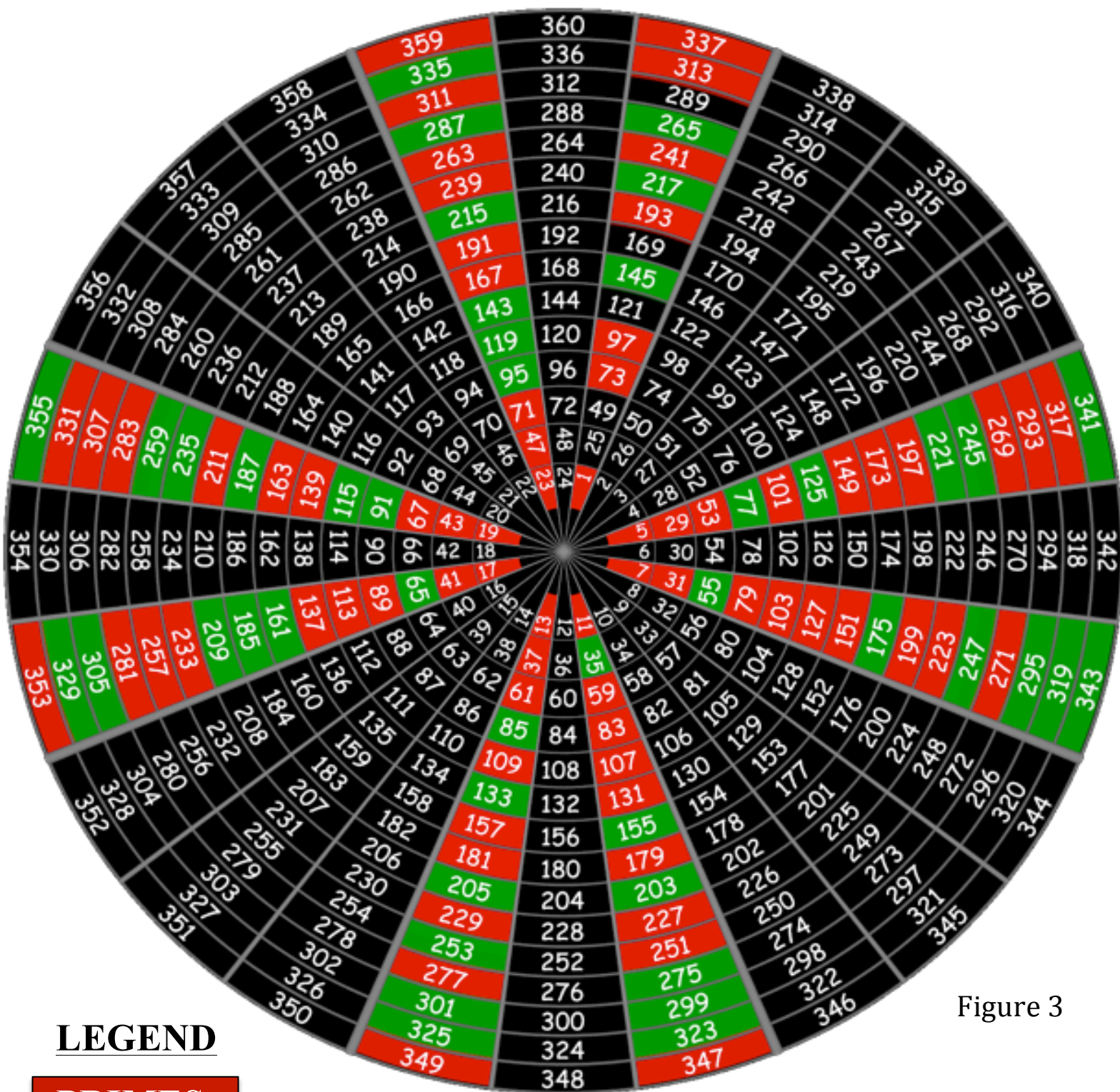71 primes highlighted in red…

Figure 3

LEGEND

PRIMES

Q-PRIMES

PRIMES^2

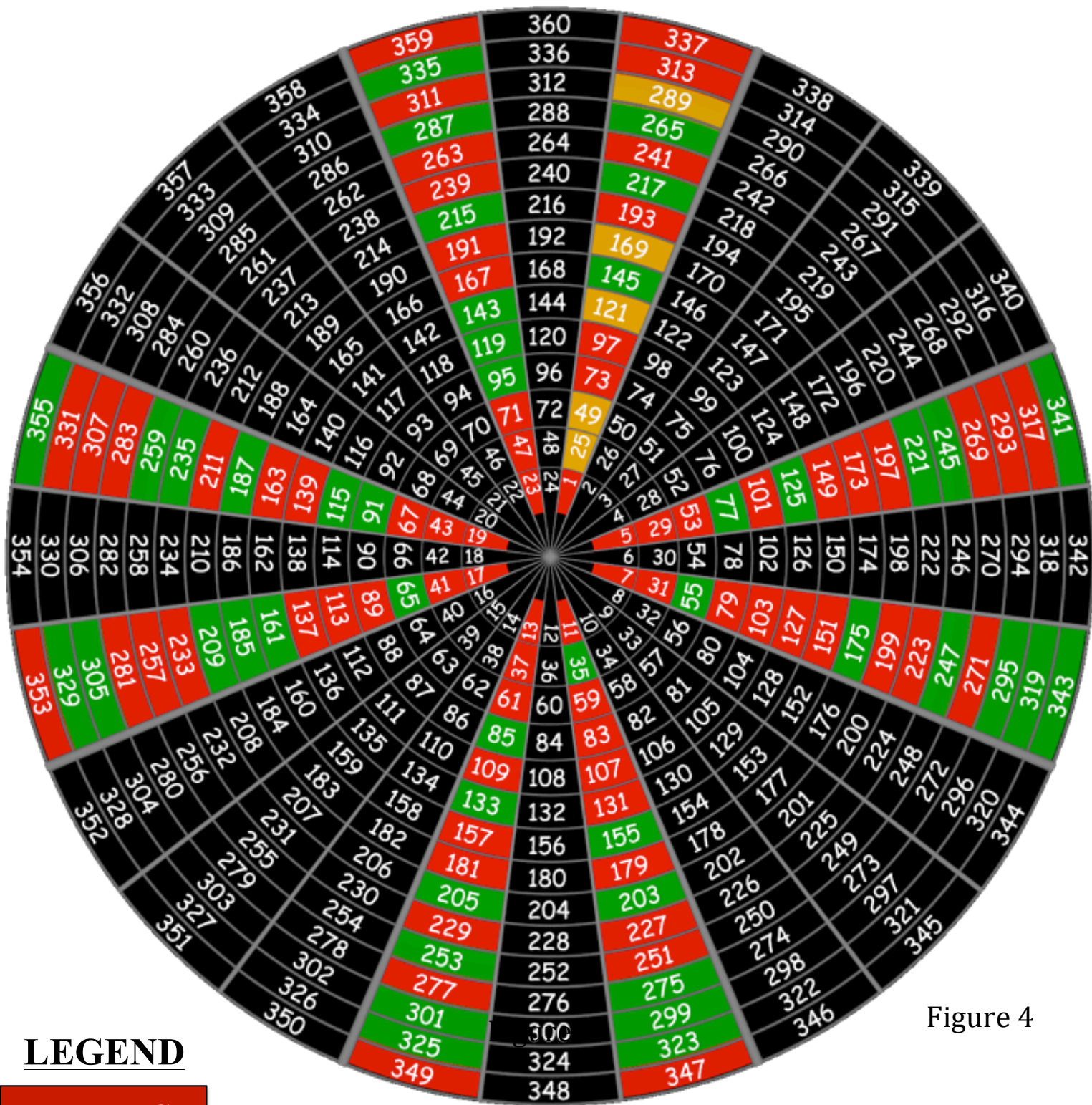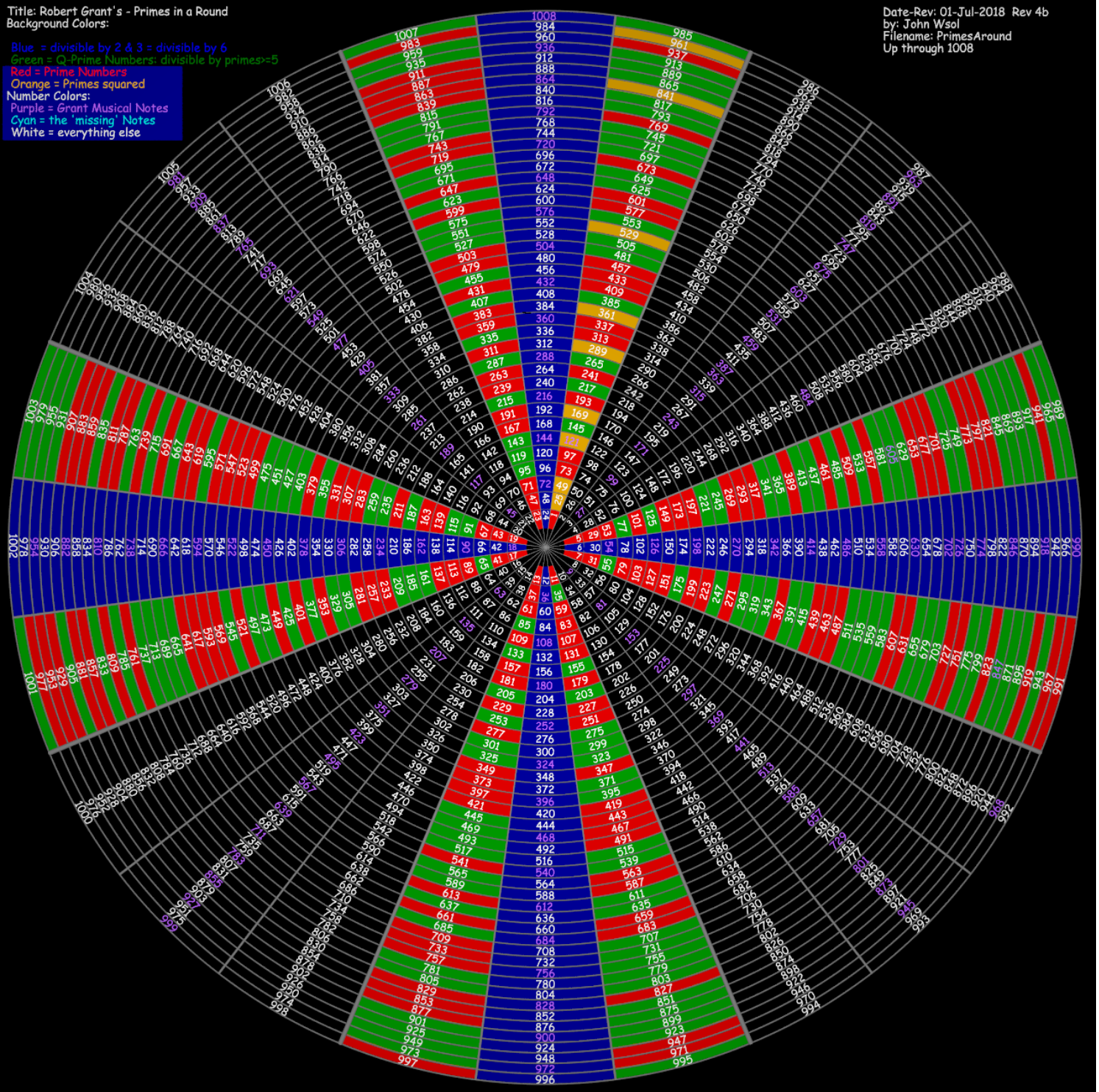44 Q-primes are highlighted in green…

Figure 4

LEGEND

PRIMES

Q-PRIMES

PRIMES^2

All 5 primes^2 only appear in modulus 1…

Figure 5

Pattern here taken out to 1008
(or 42 cycles) without break.
Proven to infinity on the
following page…

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Herewith, we demonstrate that prime numbers will always only appear in Modulus 1, 5, 7, 11, 13, 17, 19, and 23 of an Icositetragon (Mod 1-24), by looking at all of the other moduli or sectors. We determine that there cannot be a prime number within Modulus 2, 3, 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 22 with the following arithmetic.

Let's call any number in Modulus 2, A. Therefore, A = 2+24h where h is any integer. Since all numbers on Modulus 2 will have 2 as a factor, they are all not prime. Furthermore, this can be applied to all Moduli to prove that Modulus 2, 3, 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 19, 21, and 22 can not contain a prime since they have themselves as factors and are themselves not prime.

The pattern is, without calculation, proved to infinity, along with the Q-primes. Assume that the product AB lies within Modulus 6. Therefore, AB = 6+24h for some integer h. This means that AB is divisible by 2 (since both 6 and 24 are divisible by 2). But since 2 is prime, then it must divide either A or B, which contradicts the hypothesis that they are prime. The same logic can be applied to the primes^2. All three patterns are therefore proven to continue into infinity.

CONCLUSION

Prime, Q-Prime, and Prime^2 patterns are clearly demonstrated into infinity in modulus points around an icositetragon. More research is required to determine what other mathematical and physical patterns and or constants may be associated or emergent with the icositetragon alignment. Additionally, based upon these findings (particularly the advent of Q-Primes and their specific pattern) further research may lead to other new and significant discoveries, up to and including a definitive predictive pattern of infinite prime number emergence which has thus far not been identified in the literature as yet. Such a discovery may have far-reaching implications on the fields of mathematics, physics, chemistry, and cryptography among others.