Prime Number Determinacy and Prediction

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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. This information presents a method to predict prime number incidence.

SUMMARY

With the exception of only 2 and 3, prime numbers arrange uniformly within modulus 1, 5, 7, 11, 13, 17, 19, and 23. Quasi-Prime "Q-prime" numbers are products of primes ≥5. Q-primes always have either prime or product-of-prime factors and also only belong to the specified moduli. Primes Squared "Primes^2" numbers also only appear in modulus 1.

We have proven the pattern infinitum. 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.

We can then determine prime number incidence by multiplying together all Prime Moduli Numbers, excluding 1 (See Table 1). The products of the calculations are always either a Q-prime or prime^2, never a prime. Furthermore, the numbers NOT produced by the calculations are ALL, by definition, Prime (See Figure 2). Numbers that are in the array of Prime Moduli Numbers but are NOT in the array of products are proven to be prime. For the avoidance of doubt, use of this equation is proven to generate prime numbers (both known and unknown) into infinity, without the requirement of a factorization calculation or computer-driven algorithm.

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RESULTS

1	5	7	11	13	17	19	23	25	29	31	35	37	41	43	47	49	53	55	59	61	65	67	71	...
5	25	35	55	65	85	95	115	125	145	155	175	185	205	215	235	245	265	275	295	305	325	335	355	∞
7	35	49	77	91	119	133	161	175	203	217	245	259	287	301	329	343	371	385	413	427	455	469	497	∞
11	55	77	121	143	187	209	253	275	319	341	385	407	451	473	517	539	583	605	649	671	715	737	781	∞
13	65	91	143	169	221	247	299	325	377	403	455	481	533	559	611	637	689	715	767	793	845	871	923	∞
17	85	119	187	221	289	323	391	425	493	527	595	629	697	731	799	833	901	935	1003	1037	1105	1139	1207	∞
19	95	133	209	247	323	361	437	475	551	589	665	703	779	817	893	931	1007	1045	1121	1159	1235	1273	1349	∞
23	115	161	253	299	391	437	529	575	667	713	805	851	943	989	1081	1127	1219	1265	1357	1403	1495	1541	1633	∞
25	125	175	275	325	425	475	575	625	725	775	875	925	1025	1075	1175	1225	1325	1375	1475	1525	1625	1675	1775	∞
29	145	203	319	377	493	551	667	725	841	899	1015	1073	1189	1247	1363	1421	1537	1595	1711	1769	1885	1943	2059	∞
31	155	217	341	403	527	589	713	775	899	961	1085	1147	1271	1333	1457	1519	1643	1705	1829	1891	2015	2077	2201	∞
35	175	245	385	455	595	665	805	875	1015	1085	1225	1295	1435	1505	1645	1715	1855	1925	2065	2135	2275	2345	2485	∞
37	185	259	407	481	629	703	851	925	1073	1147	1295	1369	1517	1591	1739	1813	1961	2035	2183	2257	2405	2479	2627	∞
41	205	287	451	533	697	779	943	1025	1189	1271	1435	1517	1681	1763	1927	2009	2173	2255	2419	2501	2665	2747	2911	∞
43	215	301	473	559	731	817	989	1075	1247	1333	1505	1591	1763	1849	2021	2107	2279	2365	2537	2623	2795	2881	3053	∞
47	235	329	517	611	799	893	1081	1175	1363	1457	1645	1739	1927	2021	2209	2303	2491	2585	2773	2867	3055	3149	3337	∞
49	245	343	539	637	833	931	1127	1225	1421	1519	1715	1813	2009	2107	2303	2401	2597	2695	2891	2989	3185	3283	3479	∞
53	265	371	583	689	901	1007	1219	1325	1537	1643	1855	1961	2173	2279	2491	2597	2809	2915	3127	3233	3445	3551	3763	∞
55	275	385	605	715	935	1045	1265	1375	1595	1705	1925	2035	2255	2365	2585	2695	2915	3025	3245	3355	3575	3685	3905	∞
59	295	413	649	767	1003	1121	1357	1475	1711	1829	2065	2183	2419	2537	2773	2891	3127	3245	3481	3599	3835	3953	4189	∞
61	305	427	671	793	1037	1159	1403	1525	1769	1891	2135	2257	2501	2623	2867	2989	3233	3355	3599	3721	3965	4087	4331	∞
65	325	455	715	845	1105	1235	1495	1625	1885	2015	2275	2405	2665	2795	3055	3185	3445	3575	3835	3965	4225	4355	4615	∞
67	335	469	737	871	1139	1273	1541	1675	1943	2077	2345	2479	2747	2881	3149	3283	3551	3685	3953	4087	4355	4489	4757	∞
71	355	497	781	923	1207	1349	1633	1775	2059	2201	2485	2627	2911	3053	3337	3479	3763	3905	4189	4331	4615	4757	5041	∞
...	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞	∞

LEGEND	Prime Moduli Number	Q-prime	Prime^2	Table 1

This table shows the multiplication of prime moduli numbers that generates all Q-primes and primes^2 into infinity. Any number belonging to the prime moduli number array (orange) that does NOT appear in the generated array (green and yellow) is prime. With this model, we are able to predict prime number incidence infinitum.

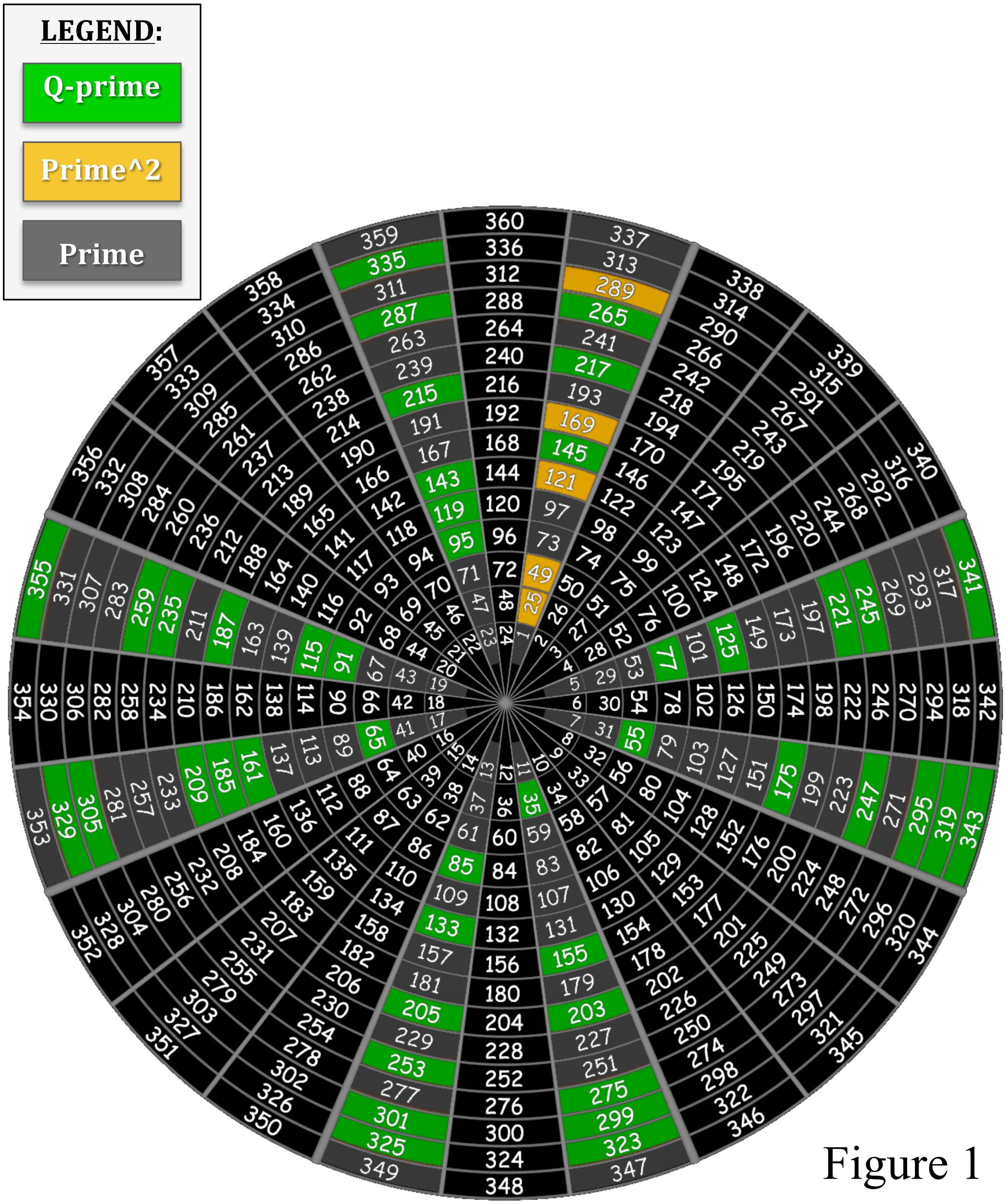

Figure 1

Highlighted Q-prime and prime^2 numbers are the products in Table 1…

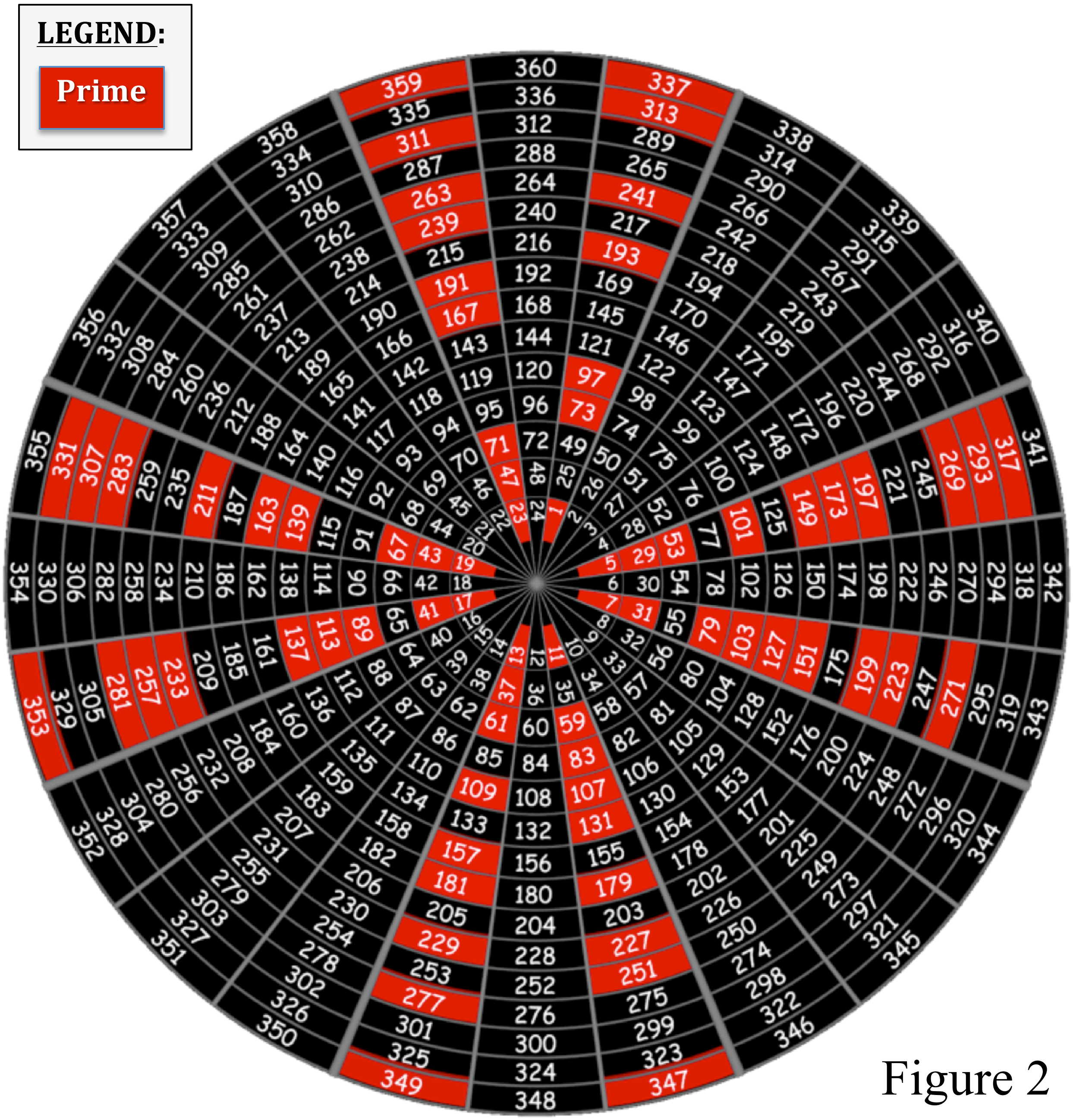

Figure 2

All primes can never be products, so the inverse of Figure 1 reveals the location of all prime numbers as the previously un-highlighted cells…

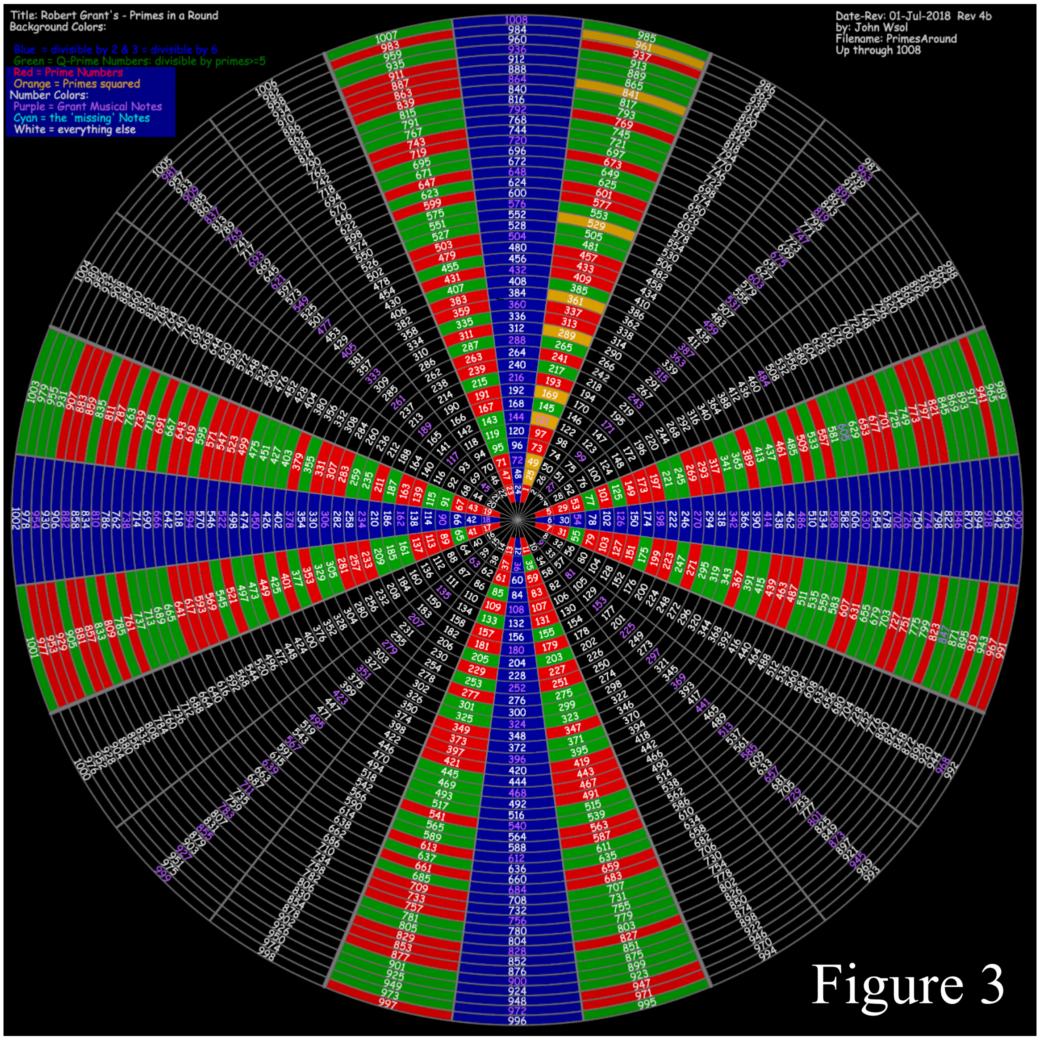

Figure 3

CONCLUSION

A tremendous amount of computational effort goes into factorizing large prime numbers, the difficulty of which provides the foundation for countless encryption techniques. This discovery therefore has significant implications for encryption methods based on prime number indeterminacy. More research is required to determine other mathematical and physical patterns and/or constancies, which may be associated and/or emergent with the icositetragon integer alignment. Novel discoveries related to the forgoing may have far-reaching implications on the fields of mathematics, physics, chemistry, and cryptography among others.

REFERENCES

[1] Grant, Robert E. M.B.A. "Prime Number Patterns Associated with Icositetragons." *Internet Archive*. Web. 7 June 2018.

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