THE 9→1 TWIN PRIMES

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INTRODUCTION

The twin primes conjecture asserts that there are infinitely many primes p such that p + 2 is also prime. The present paper proves that.

In 1849, de Polignac made the more general conjecture that for every natural number k there are infinitely many prime pairs p_n and p_{n+1} such that $p_{n+1} - p_n = 2k$. The case $k = 1$ being the twin primes problem. This paper solves the twin primes problem for the 9⟶1 twin primes. By "9⟶1 twin primes", I refer to twin primes of the form $10n \pm 1$ like 29⟶31, 59 ⟶61, 149⟶151, 179⟶181, etc. By "the prefix of a number", I would be referring to the digit before the last digit e.g. 53 is a 3 with prefix 5, 227 is a 7 with prefix 22, 983 is a 3 with prefix 98 etc. You will realise that what makes a number prime, i.e. indivisible by smaller primes, is simply the relationship between the prefix and the last digit. If we arrange prime numbers as shown in table 1, the twin primes problem can easily be solved. I am not a number theorist and am 19 but I think this paper really helps.

THE TABLE

	α class				β class		γ class	
n=1	11	13	17	19	23	29	31	37
n=2	41	43	47	49	53	59	61	67
n=3	71	73	77	79	83	89	91	97
n=4	101	103	107	109	113	119	121	127
n=5	131	133	137	139	143	149	151	157
n=6	161	163	167	169	173	179	181	187
n=7	191	193	197	199	203	209	211	217
n=8	221	223	227	229	233	239	241	247
n=9	251	253	257	259	263	269	271	277
n=10	281	283	287	289	293	299	301	307

In table 1, the α class contains primes with prefixes of the form 3n-2, the β class contains primes with prefixes of the form 3n-1 and the γ class contains primes with prefixes of the form 3n for $n \in \mathbb{Z}^{+}$. The α class has possible last digits 1; 3; 7; 9, the β class has possible last digits 3 and 9 and the γ class has 1 and 7. The three classes are **independent** since the primality of any given number in one of these classes depends on the relationship of the last digit and the prefix. There are 3 types of twin primes, namely the 1⟶3, the 7 ⟶9 and the 9⟶1 twin primes. The 1⟶3 and 7⟶9 twin primes all belong to class α. The 9⟶1 twin primes are found between the β and γ classes.

Now, from the prime number theorem, the primes generally become scarce as we tend to infinity. This happens in all the classes as we approach infinity and implies that the α twin primes become really scarce and we can never be sure that they are infinite. The β⟶γ twin primes, from table 1, are clearly infinite since it is possible to have a 9 of class β followed by a 1 of class γ even when the primes get very scarce because the two classes are independent. Most of the largest known twin primes e.g. $3756801695685*2^{666669}\pm1$ $194772106074315*2^{171960}\pm1$ $65516468355*2^{333333}\pm1$ etc are all 9⟶1 twin primes.

I am still at high school and like number theory though I do not know much of the stuff. My contacts
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