SHOW AND GIVE INFINITELY MANY PAIRS OF TWIN PRIMES OF THE FORM $\{2\cdot6^k \pm 1, k\in N\}$

Yibing Qiu

Abstract: With observations and speculation, this article puts forward a proposition about twin primes that *every pair of numbers of the form* $\{2\cdot6^k\pm1, k\in N\}$ *all be twin primes*. Proves the proposition statement is true applied Wilson's theorem and induction, show there are infinitely many twin primes of the form $\{2\cdot6^k\pm1, k\in N\}$, and conclude the twin prime conjecture statement is true.

Keywords: Twin primes; Wilson's theorem; Induction; The twin prime conjecture

"I think that only daring speculation can lead us further----- and not accumulation of facts ." Albert Einstein

"The moving power of mathematical invention is not reasoning ---------- but imagination." Augustus de Morgan

1. Introduction

The *twin prime conjecture*[1] is a beautiful open problem in *Number Theory* about primes, a pair of primes are called *twin primes* such as {11,13}, {29,31}or {101,103} of the form {p, p+2}, and the *twin prime conjecture* states that there exist infinitely many primes p such that p+2 is also prime.

In the article, puts forward a proposition about twin primes, proves the proposition statement is true applied Wilson's theorem and induction, show there are infinitely many twin primes of the form$\{2\cdot6^k\pm1, k\in N\}$, and conclude the twin prime conjecture statement is true.

By observing, with intuition and imagine, draw the following speculation:

Proposition *For every positive integer k, each and every pair of numbers of the form*

(i) $\{2\cdot6^k\pm1\}$; (ii) $\{3\cdot6^k\pm1\}$; (iii) $\{5\cdot6^k\pm1\}$; (iv) $\{7\cdot6^k\pm1\}$.

All is twin primes.

Theorem *For every positive integer k, each and every pair of numbers of the form*

$$\{2\cdot 6^k \pm 1\}$$

All is twin primes.

2. Proof of the Theorem

Theorem
Proof .

This completes the proof of the Theorem. □

3. Conclusion

By the Theorem statement, we have

There exist infinitely many primes $(2\cdot 6^k - 1)$ *such that* $(2\cdot 6^k + 1)$ *is also prime.*

Up to now, we proved that the ***twin prime conjecture*** statement is true.

References

[1] M. B. Nathanson, *Elementary Methods in Number Theory*, Beijing, Springer-Verlag, 2003.
[2] John. Stillwell, *Elements of Number Theory*, Beijing, Springer-Verlag, 2010.

607 ROOMS, 12th FLOOR, 3rd BLOCK
ZHAO FENG YUAN SECTION
FENG TAI DISTRICT
BEIJING, 100040, P. R.CHINA
E-mail address: **yibing.qiu@hotmail.com**