Beal’s Conjecture on the Polynomials with Root of Powers

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Abstract In this paper I present a polynomial different from Euler, Genochi, Bernoulli and Bernstein. Each different because each of them has a specific purpose is to say that each of these polynomials corresponds to a power of an integer and therefore exist as many polynomials as powers of integers. These polynomials are characterized by the same source (generatriz) and for this reason it is shown that: the sum of two such polynomials never is a third polynomial root corresponding to a power of an integer. This shows absolutely, Beal’s conjecture and again on T. Fermat. I think both Pierre Fermat and Andrew Beal were aware of these polynomials before stating his conjecture.

Keywords New Polynomial, Beal’s conjecture, Affirmation of the T. Fermat

1 Introduction

My period of investigation was centred in analyzing all the polynomials that we know, Euler, Genochi, Bernoulli and Bernstein; in none of them analyzes the polynomials which have by powers root. And nevertheless they are fundamental for T. Fermat [7],[10] and Beal’s conjecture.

2 Main Results

I will start indicating as I designate to these polynomials as \( (E^f_n) \) and in turn, his expression. Each power of a number have a polynomial of degree equal to exponent of the power.

\[
E^f_n m(x^n) = \frac{C^n}{2^n} = (2b + 1)^n
\]

\[
2^n E^f_n m(x^n) = C^n
\]

\[
1 + \sum_{n \geq 1} E^f_n m(x^n) = \frac{C^n}{2^n}
\]

The polynomials \( (E^f_n) \) have always as value in his coefficients \( (m) \) an sum of power of two. Later I indicate the process of generation with the first three polynomials \( (E^f_n) \).

\[
E^f_{(2)} = 2^n x^n + 2 \left( \frac{2^n}{2} \right) x^{n-1} + 1
\]

\[
E^f_{(3)} = 2^n x^n + 2 \left( \frac{2^n}{2} + \frac{2^n}{4} \right) x^{n-1} + 2 \left( \frac{2^n}{4} + \frac{2^n}{8} \right) x^{n-2} + 1
\]

\[
E^f_{(4)} = 2^n x^n + \left[ 2 \left( \frac{2^n}{2} + \frac{2^n}{4} \right) + 2^{n-1} \right] x^{n-1} + \left[ 2 \left( \frac{2^n}{4} + \frac{2^n}{8} \right) + \frac{2^n}{2} + \frac{2^n}{4} \right] x^{n-2} + \ldots
\]
3 Discussion

If into these polynomials we incorporate the constant \((-1)^n\) we have that \(1 + \sum_{n=1}^{\infty}(-1)^n m(x^n)\) already they are not polynomials of power and happen to be similar polynomials or equal to those of Euler, Genocchi, Bernstein, Bernoulli and Hermite in his analysis and development. I omit the equation and recommend the works of Araci-Acikgoz-Sen (see [3 - 6]).

The conjecture of Beal affirms that it does not exist \(A^x + B^y = C^z\) with \((A, B, C, x, y, z) \in \mathbb{Z}^+\), and in turn \((A \neq B \neq C)\), \((x \neq y \neq z) > 2\).

Therefore replacing the value \((A^x, B^y)\) by polynomials \(E_n^f m(x^n)\) we have three options.

\[
(i) A^x = 1 + \sum_{n=1}^{n_k} m(x^n); \quad B^y = 1 + \sum_{n=1}^{n'_k} m'(x^n')
\]

\[
(ii) A^x = 2^n \left[ 1 + \sum_{n=1}^{n_k} m(x^n) \right]; \quad B^y = 2^{n'} \left[ 1 + \sum_{n=1}^{n'_k} m'(x^n') \right]
\]

\[
(iii) A^x = 1 + \sum_{n=1}^{n_k} m(x^n); \quad B^y = 2^n \left[ 1 + \sum_{n=1}^{n'_k} m(x^n) \right]
\]

If now we add up respectively \(A^x + B^y\) we have:

\[
(i) 1 + \sum_{n=1}^{n_k} m(x^n) + \left( 1 + \sum_{n=1}^{n'_k} m'(x^n') \right) = 2 + \sum_{n=1}^{n'_k} \Delta m(x^n')
\]

\[
(ii) 2^n \left[ 1 + \sum_{n=1}^{n_k} m(x^n) \right] + 2^{n'} \left[ 1 + \sum_{n=1}^{n'_k} m(x^n') \right] = 2^n \left[ 1 + \sum_{n=1}^{n_k} m(x^n) + 2^{n'-n} \left( 1 + \sum_{n=1}^{n'_k} m(x^n') \right) \right]
\]

This result implies that \(1 + \sum_{n=1}^{n_k} m(x^n) + 2^{n'-n} \left( 1 + \sum_{n=1}^{n'_k} m(x^n') \right)\) it has to be a polynomial \(E_n^f m(x^n)\) and for it always will have one of the addends equal to the unit. It not possible we have the equal addend to the unit because \((2^{n'-n} + 1 \neq 1)\).

(iii) For this point the previous thing is valid.

4 Conclusion

In abstract: we know by the polynomials \(E_{n=1}^k m(x^n)\) that the sum of two of them is not a polynomial of different degree. It is simply a polynomial that has the same degree that has the polynomial of major exponent and in turn has increased the value of the coefficients (m) that have the same variable \((x^n)\). And therefore though we divide the whole polynomial by a power of \((2^n)\), not we will never have a polynomial \((E_n^f)\).

The Beal’s conjecture is true because \(A^x + B^y \neq C^z\)

The T. Fermat is true \(a^n + b^n \neq c^n\ n > 2\), and in turn is corroborated that it is not necessary to take it to another field of the mathematics to solve it, that is not the arithmetic. Therefore I reference the mistake of associating the T. Fermat with the elliptical curves, by Gehara Frey’s [see 8 ,] [2]
REFERENCES


