Tint Reuven

Number Theorist, Israel

TO THE HYPOTHESIS OF BILL (ELEMENTARY ASPECT)

Summary. *Some equations and equal equations are given. To the hypothesis of Bill.*

Key words: *equations, equations, Beal's conjecture*

1.

1) $3^2.\ 3^2+3^2.2^4=3^2.5^2$ *2)* $3^2.\ 5^2+3^4.2^4=3^2.\ 13^2$ *3)* $3^4.\ 5^2+3^2.\ 2^6=3^2.\ 17^2$ *4)* $3^4.\ 7^2+3^6.\ 2^6=3^4.\ 5^4$ *5)* $5^2.\ 3^4++5^4.\ 2^6=5^2.\ 41^2$ 6) $5^2.3^2+5^2.2^4=5^4$ 7) $5^4.3^2+5^2.2^6=5^2.17^2$

1) $9^2+12^2=15^2$ *2)* $15^2+36^2=39^2$ *3)* $45^2+24^2=51^2$ *4)* $63^2+216^2=225^2$

5) $45^2+200^2=205^2$ *6)* $15^2+20^2=25^2$ *7)* $75^2+40^2=85^2$

2. *We show that equalities with this property are innumerable (without using the previous equalities, since the use of: multiplication of equalities by the corresponding prime numbers in an arbitrary even degree is trivial). Examples:* $(13p^9)^2+(7p^6)^3=(2p^2)^9$, $(2p^6)^7+(17p^{14})^3=(71p^{21})^2$ *etc., (when the base is known), 2.* 3^2*=18 – least common multiple, 7.3.2=42 – least common multiple, - the least common multiple, p is an arbitrary prime (or other) number.*

2.1 Basics of the following equalities:

$7^2+2^5=3^4$, $3^5+10^2=7^3$, $3^5+11^4=122^2$: $2^4.\ 7^2+2^3.\ 2^6=2^4.\ 3^4$ $28^2+8^3=6^4$, *2.2* $3^5+2^3.\ 5^2=2.\ 7^3$, *2.* $3^5+2.\ 11^4=2^3.\ 61^2$, *etc. etc.*

3. *We have an equation* $(A.\ p^b)^a + (B.\ p^a)^b = p.\ p^{ab} = p^{ab+1}$ *(1),*
if $A^a + B^b = p$ *(2), when* $A = 2$*, B – arbitrary odd primes, a,b- arbitrary positive integers such that p is a prime number.*

Example: A=2. B=3, a=5, b=4. $(2.\ 113^4)^5 + (3.\ 113^5)^4 = 113^{21}$, $(2.\ 5^4)^5 + (3.\ 5^5)^4 = 113.\ 5^{20}$.

3.1 If $A = 2p_1$*, when* p_1*- arbitrary prime number not equal B, then the basis for example* $(2.3)^3 + 7^4 = 2617$*- prime number , and* $(2.\ 3^5)^3 + (7.\ 3^3)^4 = 2617.\ 3^{12}$*. In general:* $(2\ p_1^{b+1})^a + (B\ p_1^a)^b = p\ p_1^{ab}$ *(3).*

4 . It seems that (2) and (3) have countless solutions.

References

1. Tint R. The proof of Bill's conjecture is a consequence of the properties of invariant identity certain type (elementary aspect) // International Scientific Journal. Kiev, 2016. N11 (21). Vol. 1. https://doi.org/10.21267/IN.2016.3571