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DOI: 10.25313/2520-2057-2019-11-5114

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:* $(13\,p^9)^2 + (7\,p^6)^3 = (2\,p^2)^9$, $(2\,p^6)^7 + (17\,p^{14})^3 = (71\,p^{21})^2$ *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*

$$(A.\,p^b)^a + (B.\,p^a)^b = p.\,p^{ab} = p^{ab+1} \qquad (1),$$

if $$A^a + B^b = p \qquad (2),$$

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* $A = 2\,p_1$, *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