Disproof the four counterexamples for Beal's conjecture

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In *Bulletin of Mathematical Sciences & Applications*, probably by mistake, was published a paper which intended give some counterexamples of the Beal's conjecture[1].

The four examples in that paper are wrong, very wrong.

The definition of Beal's conjecture is

"If $A^x + B^y = C^z$ when $A, B, C, x, y, z \in \mathbb{Z}_+$ and $x, y, z > 2$ then A, B, C have a common prime factor."

The four counterexamples are following:

1) $2^{88} + 9\,999\,999\,999\,999^3 = 10^{39}$

The equality is false. The left side is odd and the right side is even. It's impossible.

2) $2^{233} + 99\,999\,999\,999\,999^6 = 10^{84}$

The same mistake. Odd number is not equal to even number.

3) $2^{205} + 999\,999\,999\,999\,999^5 = 10^{75}$

There is error again. Odd number is not equal to even number. The equality is false.

4) $20\,000\,000\,000\,000^3 + 15\,000\,000\,000\,000^3 = 22\,489\,707\,226\,377^3$

Now in the last example the left side is an even number and the right side is an odd number. It's impossible again. And more: the Fermat's Last Theorem is true!

Therefore the four Saravanan's counterexamples for Beal's conjecture are wrong.

If you use a few digits calculator then you might think (wrongly) that these equalities are true, but this will occur because many significant digits are discarded in a limited precision calculator. In Number Theory, unlike approximate numerical calculation, these four counterexamples are clearly falses.

REFERENCES:

1. Saravanan, S. *Beal's Conjecture – CounterExamples*, Bulletin of Mathematical Sciences & Applications, **4** (2), pp.01-02 (2015).