A NOTE ON THE SMARANDACHE BAD NUMBERS

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Abstract. In this paper we show that 7 and 13 are not Smarandache bad numbers. Moreover, we give a criterion for the Smarandache bad numbers.

Key words. Smarandache bad number, criterion program.

Let \( a \) be a positive integer. If \( a \) cannot be expressed as the absolute value of difference between a cube and a square, then \( a \) is called a Smarandache bad number. Smarandache [2] conjectured that the numbers 5, 6, 7, 10, 13, 14, ... are probably such bad numbers. However, since

\[
7 = |2^3 - 1^2|, \quad 13 = |17^3 - 70^2|,
\]

we find that 7 and 13 are not Smarandache bad numbers.

On the other hand, by a result of Bakera [1], we give the following criterion for the Smarandache bad numbers immediately.

Theorem. For any fixed positive integer \( a \), if

\[
a \neq |x^3 - y^2|
\]

for every positive integer pairs \((x, y)\) with

\[
\log \max (x, y) \leq 10^9 a^{10000},
\]

then \( a \) is a Smarandache bad number.
References


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