

A NOTE ON THE SMARANDACHE BAD NUMBERS

Maohua Le

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

$$(1) \quad 7 = | 2^3 - 1^2 | , \quad 13 = | 17^3 - 70^2 | ,$$

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

$$(2) \quad a \neq | x^3 - y^2 |$$

for every positive integer pairs (x,y) with

$$(3) \quad \log \max (x,y) \leq 10^{10} a^{10000} ,$$

then a is a Smarandache bad number .

References

- [1] A.Baker , The diophantine equation $y^2 = x^3 + k$, Phil .
Trans . Roy . Soc . London 263(1968),193-208 .
- [2] F. Smarandache , Properties of Numbers , University of
Craiova Archives , 1975 .

Department of Mathematics
Zhanjiang Normal College
Zhanjiang , Guangdong
P.R. CHINA