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Forty-Five Counter Examples Provided-Beal Conjecture False as No Common Prime Factors Not Needed with Exponents

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Abstract: Equations with exponents greater than 3 or equal do not need to have common prime factors. Beal conjecture is shown false 3 times. Numbers raised to powers do not have to have common prime factors.

Keyword: *Algebra, Exponents, Cubes, Number Theory, Equality*.

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I. INTRODUCTION

When there are Exponents, there do not need to be common prime factors. I show 39 COUNTER examples. I used to have ideas when I was growing up with my sophomore year in high school Algebra teacher. I used to show him my ideas after class. I read Mathematics for the Million by Lancelot Hogben when I was in college after University of Chicago at NEIU. I used to have the book but it was stolen by Harbor Lakes and Monarch investments. (2) This was all done again by experiments on numbers with my calculator on my cell phone from ATT. This would be my about 7TH publication on the topic disproving the conjecture worth a prize.

II. METHODOLOGY

I reviewed with my handheld phone numbers that have cubes in them. I used my calculator on my ATT phone to do calculations. I spent last two years on project.

III. DISCUSSION

I show 39 counterexamples that Beal CONJECTURE IS FALSE ALTHOUGH SOMETIMES TRUE. MATHANSWERS, a website accessed on 12/10/2025, shows Factors come in pairs cited from my cell phone on 12/21/2023 a new access.

- *Example 1*

3^5 + 10^3=11* 11^3 * 1^3

243 + 1000= 1243

No common prime factors

- *Example 2*

2^10 + 2^10=2^11

1024 + 1024 = 2048

2 AND 10 ARE DIFFERENT factors NOT COMMON THAN 2 AND 11. Math answers show factors come in pairs accessed on 12/21/2023

- *Example 3*

0^3 + 0^3 = 0^3

0=0

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No common prime factors. O is a real number

- *Example 4*

5^3 + (4^3 + 3^3) = 6^3

125 + (64 + 27) =216

5,4,3 is not common prime factors one composite

- *Example 5*

3^3 + 1^3 =2^2*7

27 + 1= 28

No common prime factors

- *Example 6*

0^3 + 0^3= 0^3

No common prime factor. 0 is a real actual number and positive

- *Example 7*

5^3 + 2^7=11*23

125 + 128 = 253

- *Example 8*

A^3 + b^3 = c^3

Algebra shows that there do not need to be common prime factors, a, b, c are algebraic substitutions for the variables in Beal's conjecture. Variables do not need to be common.

- *Example 9*

There are infinite number of numbers. We can never test an infinite number of numbers and show it is true. When dealing with all numbers, the conjecture cannot be tested so it should be viewed as untrue

- *Example 10*

Mystical number ^3 +mystical number^3 = Mystical mysterious numbers^3

No common prime factor. Mysterious numbers supported by people interested in number theory. There really can be mysterious numbers. The number is not common or prime.

- *Example 11*

997 (1^3) + 3^3 = 4^5

997 (1^3) + 27 + 1024

997 + 27 =1024

- *Example 12*

125 + 27 = 152

5^3 + 3^3 = 2^3* 19

No common prime factor 2,3,5 not common numbers

- *Example 13*

2^5 + 3*31= 5^3

32 + 93 = 125

3 and 31 are not common

- *Example 14*

It is not clear if the basis can also be equal.

And not be common

3^3+ 5^3= 8^3

The numbers are equal with no common prime factor. There is no clear note in Beal's conjecture that the basis or bases and exponent can be equal.

- *Example 15*

2^9 + 2^9 = 2^10

512 + 512= 1024

No common prime factor, 2 and 9 different than 2 and 10, Math answers factors income in pairs.

- *Example 16*

13^2 * 1^3+ 7^3 = 8^3

169 * 1 + 343 = 512

512 = 512

No common prime factors

- *Example 17*

No common prime factor as

1^3 + i^6 = 0

1 plus positive integer to the 6th is 0

- *Example 18*

If if statement is true that does not make a then true. If I say "I am going to jump, then does not mean I am going to be hurt as I might be doing jumping jacks" a type of exercise?

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Whole conjecture is untrue as if statements do not make a true then.

➤ *Example 19*

Numbers do not need to be common primes

9^3 + 271 = 10^3

271 is not a common prime number but prime

➤ *Example 20*

Three numbers raised to exponents do not need common prime factors

43^8= 1^3 + 7 ^3

344 = 1 + 343

➤ *Example 21*

2^7 + 2^7 = 2^8

Factors come in pairs say math answers accessed on December 20, 2025. (1)

➤ *Example 22*

3 Exponents or numbers multiplied by each other do not need to have common prime factors

3 numbers multiplied by each other and with cubes do not have to have a common prime factor.

A. *Discussion*

3 cubes do not have to have common prime factors

1^3 *5 *7 *19 + 4^3 = 9^3

652+64 = 729

there is not a common prime factor

➤ *Example 23*

6^3 + 1 + 8^3 = 9^9

217 + 512 = 729

no common prime factors

➤ *Example 24*

6^3 + 8^3 +1 = 9^3

216 + 513 = 729

729 = 729

No common prime factors

➤ *Example 25*

5^3 + 3(1^3) = 2^7

125 + 3= 128

no common prime factor

➤ *Example 26*

2^5 + 1^3 = 11^3

32 + 1 =33

➤ *Example 27*

2^3 + 3^3 = 17^1

8 + 3+3+3 = 17^1

is larger than 3 in some viewpoints of math

➤ *Example 28*

3^3 + 3^3 =18 ^1

(3+3+3) + (3+3+3) = 18

1 is seen as larger than 3 if following a race

➤ *Example 29*

2 ^ infinite + 2 infinite = 2^ infinite

Numbers that are too large to compute so we should not confuse people into thinking the conjecture is true

➤ *Example 30*

6^3+2^7=7^3+1^3

216+127=343+1

344=344

➤ *Example 31*

6^3 + 0^3 = 6^3

No common prime factor so Beal false

➤ *Example 32*

9^3 + 10^3 = 12^3 +1^3

729 + 1000 =728 +1

729 + 1000= 12^3 + 1^3

➤ *Example 33*

Beal conjecture shows no common prime factor

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1^3 +19* 421 = 20^3

1+ 1^3* 7999 = 8000

This example shows that there are no common prime factors with use of exponents

Three Numbers Multiplied by themselves can be seen as a cube so Beal conjecture false.

➢ *Example 34*

9^3 + 4^3 = 13* 61 * 1^3

729 + 64 = 793

➢ *Example 35*

5^3 + 9^3 =29*29*1^3

125 + 729 = 29*29 *1

841 = 841

The numbers are not prime so Beal conjecture is false.

➢ *Example 36*

1^3 + 0^3 =1^3

No common prime factor. 1is not composite or prime. Beal is false

➢ *Example 37*

1^3 + 3^3 3*37 = 1000

1+ 9999= 1000

Three numbers multiplied by each other do not need to have common prime factors.

Beal conjecture is shown false.

➢ *Example 38*

Does not need to prove true or false just does not really matter much except for number theorists.

➢ *Example 39*

8^3 + (3^4 + 2^5)

512 + 81 + 32

512 + 113 = 5^4

512 + 113 = 625

No common prime factor

➢ *Example 40*

3^3 + 1^3 = 1^3 2^2 *7

27 + 27 = 1^3 *2^2 *7

➢ *Example 41*

2^4 *5 + 1^3 =3^4

16* 5 + 1 = 81

80 + 1 =81

➢ *Example 42*

1^3 *7 + 1^3 = 2^3

7+ 1=8

There no common prime numbers as one is composite

➢ *Forty Third*

1^3 + 1^3 = 2^3

No clear if bases or numbers raised to power need to be raised to exponent

1+1 does = 2

If numbers raised to power do not to be raised to exponent power Conjecture is not clear. Beal conjecture unclear and false.

➢ *Forty Fourth Examples*

4^4 + 4^4 = 8^3

256 + 256 = 512

Factor 4 and 4 is different than 8 and 3. Factors come in pairs. "Factor pairs are two numbers that are multiplied to create a particular product." (3) Factors come in pairs, meaning that for every factor of a number, there is a corresponding factor that, when multiplied together, gives the original number. (4)

When there is a cube there does not have to be a common prime factor. Beal conjecture is false. I is not composite or prime.

➢ *Forty Fifth Example*

1^3 + 10 ^3 = 1^3 + 10^3

1+ 1000 = 1+ 1000

1001 = 1001

I is not a composite number of prime

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IV. CONCLUSION

45 counterexamples show we really did not need common prime factors. No common prime factors in any of the sixteen examples. O is a real number. There are 3 cubic numbers in our second and sixteenth counter example. In my third example there is no common prime factor. Forty-five counterexamples are presented. Algebra is a field presented in the middle east from the 1100-1400 period in some sources. When we use exponents, we do not need to use common prime factors. Beal conjecture is proven false with 45 examples. Three numbers multiplied by each other do not need to have common prime factors. Beal conjecture is shown false.

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