International Journal of Science Academic Research
Vol. 03, Issue 11, pp.4650-4653, November, 2022
Available online at http://www.scienceijsar.com
ISSN: 2582-6425

Research Article

BEAL CONJECTURE IS FALSE AS PRIME FACTORS ARE NOT NEEDED FOR EQUATIONS WITH NEARNESS OR APPROXIMATE EQUALITY AND 28 OTHER COUNTEREXAMPLES

[1, 2,] *James T. Struck

[1]President A French American Museum of Chicago
[2]President Imaginary Heaven University

Received 16th September 2022; **Accepted** 24th October 2022; **Published online** 23rd November 2022

INTRODUCTION

Many equations can have Beal like requirements and not have prime factors in common. Beal conjecture raises a question involving x, y, z all greater than 2 as a group. Due to the statement of problem, 3, 3, 2 are greater as a group then 2. Due to that statement of problem, the conjecture is false as many Beal-like equations do not have to have common prime factors. $1^3 + 2^3 = 3^2$ follows Beal conjecture format without having common prime factors. The conjecture is false by counterexample.

Study Design: we consider case studies

Place of Study- Chicago area and suburbs

Methodology- We consider many examples and counterexamples

Results: We consider the Beal Conjecture false with consideration of counterexamples

Conclusion: Beal Conjecture is false when considering a number of counterexamples and case studies.[1]

RESULTS AND DISCUSSION

We consider many case studies and counterexamples

1) $5^3 + 6^3 = 7^3$

125 + 216 =341 close to 343

so the equation has a type of nearness or approximate equality meeting the requirements of the conjecture.

Still the three numbers do not have common prime factors. Common prime factors are not needed for Beal looking equations.

Another counterexample is
2) $13^2 + 7^3 = 8^3$

Of the three exponents 2 of them are larger than 2, so the conjecture statement is complied with

Corresponding Author:** ***James T. Struck

There is no common prime factor in the 3 base number integers

With no common prime factor the conjecture is false

169 + 343 =512

"Beal's conjecture is a generalization of Fermat's Last Theorem. It states: If $A^x + B^y = C^z$, where A, B, C, x, y and z are positive integers and x, y and z are all greater than 2, then A, B and C must have a common prime factor." From American Mathematical Society website accessed 8/ 4/2022.
We can show many counterexamples involving one of the exponents having a value 2 where x, y, z are all greater than 2.

More Counterexamples

3) $6^3 + 3^3 = 3^5$ The 6 and 2 are not common prime factors to all 3 A,B,C
4) $1^3 + 2^3 = 3^2$ A,B,C do not share common prime factors
5) $5^2 + 10^2 = 5^3$ The 10 and 2 are common prime factors to all 3 A,B,C
6) $3^2 + 6^3 =15^2 = 9+ 216=225$ but the 6, 5, 15 are not common prime factors to all 3,A,B,C
7) $13^2 + 3^3 =14^2$ there are no common prime factors involved but x, y, z together are greater than 2
8) 0 can be seen as a positive integer so $0^3 + 0^3 = 0^3$ and those numbers are not common prime factors
9) The factors are not common as the factors are linked always to number A B and C not to all three. Factors can never really be completely common prime factors
10) $1^3 + 5^3= 3^{42}$ equal when exponent demands or suggests addition of base number but no common prime factors are found so Beal conjecture false. Beal conjecture disproved by using addition view of exponents with regard to bases.
11) Beal Conjecture False as Exponents are a symbol of how many cents on a price

Exponents can be seen as how many cents are in a price displayed for sale. With cents meaning of exponents, common prime factors are not needed

Discussion

Look at exponents as meaning cents. Exponents can be seen as 3 cents or 30 cents but either way no common prime factors in A, B and C in base number.
$1^3 +2^3=3^6$

with no common prime factors so Beal conjecture false. Since raised number to right of a number is seen as how many cents on price, view of exponents as coin symbols or how many cents disproves the Beal conjecture as common prime factors not needed. 1, 2 and 3 do not have common prime factors.

12) Exponents Mean Display Base Exponent Number Times Disproves Beal Conjecture

Looking at a different meaning of exponents as asking for display of a base the exponent number of times allows an easy disproof of Beal conjecture.

Discussion

When Exponents mean how many times the base is displayed, Beal is false.

13) Case 13

$2^3+3^3= 5^3$ means 222 + 333=555 but common prime numbers not needed.

14) Case 14

$3^3 + 5^3 = 8^3$ means 3 3 3 + 5 5 5 = 8888 but common prime numbers are not needed

15) Case 15

$13^3 + 7^3 = 20^3$ means 13 13 13 + 7 7 7 = 20 20 20 with no common prime factor

16) Counterexamples 16 and 17

Beal Conjecture Counterexamples Involving Point Geometry and Greater than concepts

Introduction

If we put five points over one point, the one point still looks like 5 points. 5 Points appear to be similar to 5 points. When 5 points are written over 1 point, the point looks like 1 point

Discussion

[17]Counterexample 18

$1^3 + 1^3 = 2^1$ where 1 has 5 points over it or equal 2^5
the 1 as the last exponent is identical as a point to 5 points so the Beal conjecture is false. The 1 actually has 5 points inside it but looks like 1 point. We do not have common prime factors for the example with 1 point being equal geometrically to 5 points.

Counterexample 19

[19] $1^3 + 1^3 = 2^1$

Where the exponent 1 is seen as greater than 2 as finishing first in a race is seen as better than finishing 2^{nd}. No common prime factors are found.

[20] Beal Conjecture False as Prime Factors are Not Needed

Simple examples show that common prime factors are not needed.

Discussion

$1^3 + 2^3 = 3^2$

Two of the exponents are larger than 2, so the greater than 2 requirements are met. There are no common prime factors.

Beal conjecture False as common prime factors Not needed

Introduction

The three exponents together can be greater than 3 to show the Beal conjecture false.

Discussion

Consider example where the 4 in the exponents is larger than 3

[21] $3^2 + 2^4 =5^2$
9 + 16 =25

there is no common prime factor so Beal conjecture is false

Beal Conjecture Disproved With Imaginary Numbers

Introduction

I show a disproof of Beal conjecture using imaginary numbers which were invented by Renee Descartes in the Enlightenment period.

Discussion

Imaginary numbers were shown to exist by Renee Descartes and others. We use an integer number of imaginary numbers to show the Beal Conjecture false.

[20] $(i^6 + 9^3) + 10^3 = 12^3$

i^2 i^2 i^2
-1 -1 -1
$(^-1 + 729) + 10^3 = 12^3$

There are no common prime factors there. With no common prime factors Beal is a false conjecture.

[22] $i^6 + 1^3 = 0^3$
$-1 + 1 = 0^3$

There are no common prime factors there with an integer number of imaginary numbers

[23] $10^3 + (9^3 + i^6) = 12^3$

There are no common prime factors present in the equation. I am using an integer number of imaginary numbers. Equality is shown but there are no common prime factors.

[24] $10^3 + 9^3 = 12^3$

Is approximately equal
1000+ 729 =1728

The 2 sides have approximate equality.

[25] Exponents are punctuation so $3^3+2^3=5^3$ where exponents like apostrophe are inoperative. No Common prime factors are needed for the equation of Beal. Beal Conjecture is false and disproved.

[26] $0^3 + 8^5 = 8^5$

Where there is one zero, there do not need to be common prime factors

[27] $0^5 + 0^5 = 0^5$

There is no common prime factor and zero is positive or not negative

[28] $3^{13} + 5^3 = 8^{16}$ shows Beal Conjecture is false as exponents can be seen as exponents seen as asterisks, minutes, seconds, cents, and or as numbers to ignore. Integers do not need to be common prime factors.

A related theorem Fermat's Last Theorem is false or can be shown false too.

[29] Fermat's Theorem is false too as $2^3+2^3 = 2^4$. Exponents larger than 2 possible unlike Andrew Wiles proof. There are integer solutions for n>2 as Fermat's Last theorem arguably talked about. Fermat may not have had a last theorem. What his margin note was about is not entirely clear. We can't talk to Pierre de Fermat as he lived in the 1600's

[30] Factors do not need to be common to all 3 integers in the Beal conjecture equation so the Beal conjecture is false.

$8^3 + 8^3 = 2^{10}$

The number 8 is not a common prime factor to all 3 integers, so the numbers do not meet the must requirement of the Beal conjecture. Not all the factors must be common prime factors.

[31] $3^6 + 10^3 = 12^3 + 1^3$

729 + 1000 = 1728 +1
1729 = 1729

there are no common prime factors, so the Beal conjecture appears to be false. The integers involved do not have any common prime factors. All the exponents are greater than 2 meeting the requirements.

[32] $2^{\text{Infinite exponent}} + 3^{\text{Infinite exponent}} = 5^{\text{infinite exponent}}$

The base integers do not have to have common prime factors. Where the 2 raised to a power will always be divisible by 2, the 3 will not have a common prime factors and 5 will not have a common prime factor, so the Beal Conjecture is false

[33] $(6^3 + 8^3) + 1^3 = 3^6$

(216 + 512) + 1 =729

728+ 1=729

there are no common prime factors, so the Beal conjecture appears to be false. The integers involved do not have any common prime factors.

[34] Some numbers are seen as special as the magic number 1792 which is the sum of 2 integers cubed. I here show 728 to be a new magic number showing a similar achievement to the Indian British mathematician Ramanujan.
$8^3 + 6^3 = 512+ 216=728= 9^3 + -1^3=728= 729 +-1$

$8^3 + 6^3 = (9^3 + -1^3) = 728$

No common prime numbers involved in the equation, so Beal conjecture false. From the perspective of the positive integers being seen as negative integers, the -1 is a positive integer too. Common prime factors do not need to be involved in Beal conjecture types of equations.Showing a new magic number is an achievement in mathematics showing Ramanujan's number is not unique.

[35] Beal conjecture disproved as zero does not need common prime factors

$0^5 + 0^5 =0^5$

The equation does not have common prime factors. The integers are each zeros but not common prime factors. 0 is not a prime number.

Also consider $0^3 + 0^3 =0^3$ but those are not prime factors. O is a positive integer as it is non-negative.

[36] Greater than 2 can equal 1 so

$2^1 + 3^1 = 5^1$

1 is greater than 2 as finishing first is seen as better than finishing 2nd in school and in a race. There are no common prime factors involved.

[37] Another example considers algebraic use of words

$\text{Integer}^3 + \text{Integer}^4 = \text{Integer}^7$

There are no common prime factors involved

[38] We can consider the exponent as an inoperative invention and ignore it to show Beal false

$3^4 + 5^4 = 8^4$

We do not need to act on the exponents we can see them as inoperative and ignore them

[39] We can consider the base integers to have different chemical compositions and not see them as common

Cobalt 4^5 + Gold 5^4 = Silver 5^4

[40] We can consider the base integers to have different colors and therefore not be common
Blue 4^5 + Yellow 6^4 = Orange 10^4

The colors make integers not have common prime factors.

Conclusion

0 is a positive integer but it is not prime so the Beal conjecture is proved false. With an integer number of imaginary numbers, Beal conjecture is shown false with no common prime factors. We use simple numbers with non-common prime factors to show Beal conjecture false. 0 is a positive integer too and $0^3 + 0^3 = 0^3$. No prime factors in the 0 example either so Beal disproved. Common prime factors are not needed so the Beal conjecture is false. Beal conjecture shown false with use of points. 1 point appears to be identical to 5 points. There are no common prime factors for our above counterexample. Greater than concepts are open to interpretation showing no common prime factor is needed. Beal conjecture shown false with many counter examples. Beal conjecture is false as exponents seen as number of cents on a price shows common prime factors not needed. Exponents mean display of the base an exponent number of times disproves Beal. Beal conjecture is false based on meaning of exponents as asking for the base to be displayed the number of times of the exponent. Beal Conjecture is false as common prime factors are not needed for Beal type of equations with exponents all greater than 2. Beal conjecture is shown false with counterexamples showing cases where common prime factors are not needed. We find evidence that the Beal Conjecture is false. An exponent can be seen as an extraneous symbol and not acted upon. Like an accent, an exponent can be seen as just a symbol not to be acted upon. With an integer number of imaginary numbers, Beal conjecture is shown false with no common prime factors. We use simple numbers with non-common prime factors to show Beal conjecture false. 0 is a positive integer too and $0^3 + 0^3 = 0^3$. No prime factors in the 0 example either so Beal disproved. Common prime factors are not needed so the Beal conjecture is false. Beal conjecture shown false with use of points. 1 point appears to be identical to 5 points. There are no common prime factors for our above counterexample. Greater than concepts are open to interpretation showing no common prime factor is needed. Beal conjecture shown false with a multitude of counter examples. Beal conjecture is false as exponents seen as number of cents on a price shows common prime factors not needed. Exponents mean display of the base an exponent number of times disproves Beal. Beal conjecture is false based on meaning of exponents as asking for the base to be displayed the number of times of the exponent. Beal Conjecture is false as common prime factors are not needed for Beal type of equations with exponents all greater than 2. Beal conjecture is shown false with counterexamples showing cases where common prime factors are not needed.

Acknowledgements: I would like to thank my mother Jane Frances Back Struck as she said words like “leave me alone” Princess, birds of the air, heaven, big frog and was discriminated against for her word use.

REFERENCE

1. “Counterexample.” From the New York Public Library Desk Reference, 1992. Philosophical Terminology.

****