ABC Solution Part 2

Author: Li Kexiong

A. [Rad(ABC)]^(1+s) / C = (xyz)^(1+s) / C. s > 0.

(A, B) = 1.

It is obvious:

(x, y) = 1. (x, z) = 1. (y, z) = 1. (xy, zw) = 1.

zw = C = A + B. A, B and C are natural numbers.

B. According to their " distinct prime products" and never have any intersections one another, we make an abstraction: they are " 3 independent functions " from the function point of view.

C. Then, please forget everything about ' distinct prime products ' for the time being.

why? Because the concept ' prime products' has already finished its job after the abstraction;

why? Because you can never classify what is 'A', what is 'B', so x and y, and predict C's prime factors with some definition or some theorem.

The ABC's prime factors are always mixed randomly, just

getting together here and there.

D. Where is the way out ?
We only can grasp the main point ---
" the 3 independent functions".

I think it is the most important point of ABC.

E. Just treat x,y and z as "3 functions of real variable" which are independent each other, and all are continuous, differentiable and integrable.

x,y and z are conformed with 3 real variable functions on the point of that " the 3 are independent each other".

Thus, when one is a variable, the other two become 2 constants, when they have some same maths operations together, for instance, differentiation or integration.

F. Yes, you can say it is a ' jump', but we have the important base of the ABC character, we jump from ABC foundation.

Actually we have enlarged the scope to discuss it.
And, natural numbers are a part of real numbers.

Anyway, start from here, what we will get is the final test.

G. Now we do the integrations on the 3 independent ones in turn:
look upon the followings as "differential equations".
Note, if one is a variable, the others are constants.

1. integration [(xyz)^(1+s) /C] (dx / dx) > or = a > 0.
from 0 to x,
get (xyz)^(1+s) / C (2+s) > or = a > 0.

2. then dy / dy = 1, after the integration, from 0 to y,
get (xyz)^(1+s) / C (2+s)^2 > or = a >0.

3. then d [z^(1+s) /C] / d [z^(1+s) /C] = 1,
after the integration, from 0 to z^(1+s) /C,
get (xyz)^(1+s) / C 2^1 (2+s)^2 > or = a >0.

Repeat 1. 2. and 3. again and again, it can approach 'a' >0

We get (xyz)^(1+s) / C 2^u (2+s)^v > or = a > 0.
u and v are finite integers > 0.

Here u and v should have their limitations, if not, 'a' will be forced to reach 0, this will contradict that we have already known since the ABC was born.
Thus, u and v should be " finite integers > 0 ".

H. In the meantime, we know the ABC problem can be expressed as follows:

Suppose we can get the smallest (xyz)^(1+s) / C, we can also make it > 1/ 2^q (2+s)^k > 0, q and k finite integers>0.

I. Actually we don't need the 3 independent ones in turn, just directly use x or y to get:

(xyz)^(1+s) / C > or = 1 / (2+s)^n > 0.
n is a finite integer > 0.

or use x or y once, then use z^(1+s) /C m times,
(xyz)^(1+s) / C > or = 1 / (2+s) [2^m] > 0.
m is a finite integer > 0.

J. About 'good ABC ratio'

We can look the above as the extreme of ABC,

1/ 2^q (2+s)^k = 2^q (2+s)^k / [2^q (2+s)^k]^2,
then ' log' the top and the bottom of the above fraction,
get log C / log [Rad ABC] < or = 2.

ABC Theorem Lkx

[Rad (ABC)]^(1+s) / C > or = 1 / 2^q (2+s)^k > 0.

or: [Rad (ABC)]^(1+s) / C > or = 1 / (2+s)^n > 0.

or: [Rad (ABC)]^(1+s) / C > or = 1 / (2+s)(2^m) > 0.

q, k, n and m are finite integers > 0, s > 0,
A, B and C are natural numbers, (A, B) = 1, A + B = C.

"Good ABC ratio" is
log C / log [Rad (ABC)] < or = 2.

Written by Li Kexiong on Nov. 18, 2005.

Add 7 - 102 Longchuanbang New Village,
Changzhou, Jiangsu, China.

Tel 86 519 6631884
Email likexiong@hotmail.com