PART № 4

ALGORITHM-PROOF
CONJECTURE BEAL

It is problem,
formed by A. Beal :

Let's take A, B, C, x, y, z are positive whole numbers at which
x, y, z > 2 .
If there are solutions of this equation

(77) $$A^x + B^y = C^z$$

then
A, B, C have a common multiplier .

I offer to you attention a solution of this problem
as solution of system of equations by A. Beal and P.Fermat :

(78) $$\left| \begin{array}{l} a^n + b^n = c^n \\ A^x + B^y = C^z \\ A^p x + B^q y = C^r z \end{array} \right.$$

Algorithm-Solution of this system of equations supports
mathematical foreknowledge by A.Beal and connection of this foreknowledge
with ELEMENTARY ALGORITHM-PROOF
of the last theorem by P.Fermat.

Theorem

System of equations:

(79) $$\left| \; \left| \begin{array}{l} a^n + b^n = c^n \\ A^x + B^y = C^z \\ A^p x + B^q y = C^r z \end{array} \right. \right.$$

has a base solution in a form of identical equality
of two natural numbers :

$$\left| \begin{array}{l} 2 = 2 \\ 9 = 9 \end{array} \right. \quad (80)$$

infinite enhancement of base solution (80) is executed at the expense of infinite variety of common multipliers:

$$\left| \begin{array}{l} 2 \times S_2 \\ 9 \times S_3 \end{array} \right. \quad (81)$$

that have invariant view:

$$\left| \begin{array}{l} S_2 = 2^n \\ S_3 = (3^3)^n \end{array} \right. \quad (82)$$

at any whole meaning of n in the second case and at any even meaning of n in the first case.

PROOF OF THE THEOREM

Base solution (80) of the system (79) has a number of equivalent views:

$$\left| \begin{array}{l} [2 = (1+1)] = (3-1) \\ 9 = (3+3+3) = [(1+2^3) = 3^2] \end{array} \right. \quad (83)$$

That transforms enhancement (81) of the base solution (80) into two fundamental forms of theory of numbers :

$$\left| \begin{array}{l} [(1+1) = 2] \times S_2 \\ [(1+2^3) = 3^2] \times S_3 \end{array} \right. \quad (84)$$

These forms, taking into consideration (82) , come to easily calculated view:

(85)

$$\left|\begin{array}{l}[(1+1)=2]\times 2^{n}\\ [(1+2^{3})=3^{2}]\times(3^{3})^{n}\end{array}\right.$$

Each infinite variety of calculated solutions (85) can be infinitely enhanced at the expense of multiplying for any natural number N form infinite variety of natural numbers:

(86)

$$\left|\begin{array}{l}\{[(1+1)=2]\times 2^{n}\}\times N\\ \{[(1+2^{3})=3^{2}]\times(3^{3})^{n}\}\times N\end{array}\right.$$

It is easy to mention the role of common multiplier N in formulas (86) can take any rational or any irrational number.
According to Gedel theorem of incompleteness, any mathematical proof should be comcluded with formulas for calculation of the proven .
Formulas (85) and (86) meet objectives of Gedel theorem.

Let's demonstrate effectiveness of formulas (85) and (86).
First let's see their application for solution of A. Beal equation on definite examples.

Example 1.

We have equation

$$A^{x}+B^{y}=C^{z}$$

Considering n = 1 , then , see (85), we find:

$$S_{3}=(3^{3})^{1}$$

$$[(1+2^{3})=3^{2}]\times 3^{3}$$

That is equivalent to equation:

$$3^{3}+6^{3}=3^{5},$$

Here A=3, B=6, C=3, x=3, y=3, z=5
Common multipliers in which are numbers

3 and 3^{3}

According to (86) we calculate :

$$(3^{3}+6^{3}=3^{5})\times N$$

Example 2

We have equation

$$A^x + B^y = C^z$$

Considering n = 2, then ,see (85) ,we find:

$$S_3 = (3^3)^2$$

$$[(1+2^3) = (3^2)] \times 3^6$$

That is equivalent to equation:

$$3^6 + 18^3 = 3^8$$

Here A=3 , B=18 , C=3, x=6, y=3, z=8 .
Common multipliers in which are numbers:

3 and 3^6

According to (86) we calculate:

$$(3^6 + 18^3 = 3^8) \times N$$

Example 3

We have equation

$$A^x + B^y = C^z$$

Considering n = 3, then . see (85) ,we find:

$$S_3 = (3^3)^3$$

$$[(1+2^3) = 3^2] \times 3^9$$

That is equivalent to equation:

$$3^9 + 54^3 = 3^{11}$$

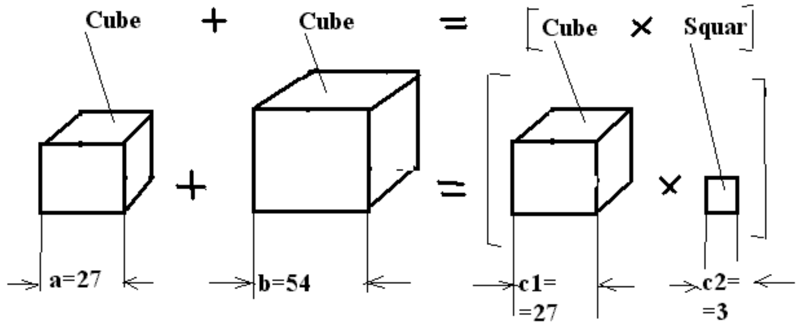
Here A=3, B=54, C=3, x=9, y=3, z=11 .
Common multipliers in which are numbers:

3 and 3^9

According to (86) we calculate:

$$(3^9 + 54^3 = 3^{11}) \times N$$

According we have geometrical and arithmetical models of example 3 :



$$27^3 + 54^3 = [27^3 \times 3^2]$$

Example 4

We have equation

$$A^x + B^y = C^z$$

Considering n = 4 , then ,see (85) ,we find :

$$S_3 = (3^3)^4$$

$$[(1+2^3) = 3^2] \times 3^{12}$$

That is equivalent to equation :

$$3^{12} + 162^3 = 3^{14}$$

Here A=3, B=162, C=3, x=12, y=3, z=14 .
Common multipliers in which are numbers :

$$3 \quad \text{and} \quad 3^{12}$$

According to (86) we calculate :

$$(3^{12} + 162^3 = 3^{14}) \times N$$

Example 5

We have equation

$$A^x + B^y = C^z$$

Considering n = 8 , then , see (85) ,we find :

$$S_2 = 2^8$$

$$[(1+1) = 2] \times 2^8$$

That is equivalent to equation :

$$2^8 + 4^4 = 2^9$$

Here A=2, B=4, C=2, x=8, y=4, z=9 .

Common multipliers in which are numbers :

2 **and** 2^8

According to (86) we calculate :

$$(2^8 + 4^4 = 2^9) \times N$$

Example 6

We have equation

$$A^x + B^y = C^z$$

Considering n = 50 , then , see (85) ,we find :

$$S_3 = (3^3)^{50} = 3^{150}$$

$$[(1 + 2^3) = 3^2] \times 3^{150}$$

That is equivalent equation :

$$9^{75} + (1{,}435796 \times 10^{24})^3 = 3^{152}$$

Here $A = 9$, $B = (1{,}435796 \times 10^{24})$, $C = 3$, $x = 75, y = 3, z = 152$

Common multipliers in which are numbers :

3 **and** 3^{150}

According to (86) we calculate

$$[9^{75} + (1{,}435796 \times 10^{24})^3 = 3^{152}] \times N$$

Example 7

We have equation

$$A^x + B^y = C^z$$

Considering n=61, then, see (85) , we find :

$$S_3 = (3^3)^{61} = 3^{183}$$

$$[(1 + 2^3) = 3^2] \times 3^{183}$$

That is equivalent equation :

$$3^{183} + (2{,}5434695 \times 10^{29})^3 = (243)^{37}$$

Here A=3 , B= $2{,}5434695 \times 10^{29}$ **, C=243, x=183,**

y=3, z=37.

Common multipliers in which are numbers:

3 and 3^{183}

Exaple 8 , [see (92) – (99)] .

We have basis equation of P.Fermat

(87) $$a_*^{\,n} + b_*^{\,n} = c_*^{\,n}$$

If $n = 8$, $v = 13$, $u = 6$, $S_3 = (3^3)^8 = 3^{24}$, see (82) and (85) ,

Then we calculate natural numbers of Pythagoras :

(88) $$\left|\begin{array}{l} a_0 = v^2 - u^2 = 133 \\ b_0 = 2vu = 156 \\ c_0 = v^2 + u^2 = 205 \end{array}\right.$$

and irrational roots for basis equation (87) of P.Fermat:

(89) $$\left|\begin{array}{l} a_* = \sqrt[n]{a_0^{\,2} \times S_3} = \sqrt[8]{17689 \times 3^{24}} = \\ = 3895{,}857535 \\ \\ b_* = \sqrt[n]{b_0^{\,2} \times S_3} = \sqrt[8]{24336 \times 3^{24}} = \\ = 4054{,}350645 \\ \\ c_* = \sqrt[n]{c_0^{\,2} \times S_3} = \sqrt[8]{42025 \times 3^{24}} = \\ = 4340{,}888414 \end{array}\right.$$

Comment - see (92) –(99) .

ET CETERA, ET CETERA …….

All given above examples support the conclusion, coming out of fundamental forms (85) and (86) of numbers theory:

NUMBER OF SOLUTIONS , WHICH MEET CONDITIONS OF THE THEOREM – HYPOTHESIS BY A. BEAL , URGES TOWARDS INFINITY.

See at that:
http://yvsevolod-28.narod.ru/index.html

What contradicts this conclusion is a conclusion of authors of the following publication:

H.Darmon and A.Granville, On the equations $z^m = F(x,y)$ and $Ax^p + By^q = Cz^r$. Bull. London. Math. Soc.27(1995), 513-543. See [12] .

Authors of this publication think that there is a limited variety of solutions , INDIRECTLY supporting fairness of A.Beal hypothesis .

Authors give ten examples, quasi supporting their conclusion. Among these examples there is the following one:

$$\left| \begin{array}{l} 1 + 2^3 = 3^2 \\ 2^5 + 7^2 = 3^4 \\ 7^3 + 13^2 = 2^9 \\ 2^7 + 17^3 = 71^2 \\ 3^5 + 11^4 = 122^2 \\ 17^7 + 76271^3 = 21063928^2 \\ 1414^3 + 2213459^2 = 65^7 \\ 43^8 + 96222^3 = 30042907^2 \\ 9262^3 + 15312283^2 = 113^7 \\ 33^8 + 1549034^2 = 15613^3 \end{array} \right. \qquad (90)$$

But in this examples there are no common multipliers A, B and C .
So they have nothing in common with common problem of A. Beal and P. Fermat.

Among 10 examples we find :

(91) $$1+2^3=3^2$$

They couldn't see in this example a simple decomposition of number 9 into original natural numbers (1,2,3), as I have done. See at that (80), (81), (82) and (50). Just from this decomposition starts elementary algorithm of numbers theory, that led me to final solution of system of equations A.Beal – P.Fermat, see. (79).

If we apply to my formulas (85) , we will find an example as a part of my universal formulas.
So, the mentioned authors were very close to common positive decision of the A.Beal problem, but their original (rather complicated) mathematical model failed in the very beginning .

PRIMARY CONDITIONS OF THE TASK WERE NOT ADEQUATE TO PRIMARY CONDITIONS OF HYPOTHESIS BY A.BEAL

I explain it with the fact that, pure mathematics, including theory of numbers, doesn't use opportunities of Principle of general (geometrical) co-variability by Pifagorus at which numbers (1, 2, 3) play main role in all disciplines of natural sciences . See also:
http://yvsevolod-26.narod.ru/index.html
http://yvsevolod-27.narod.ru/index.html

Let's have a look at system of equations (79) from the point of view of P.Fermat problem.

THE SYSTEM EQUATIONS OF P. FERMAT HAS TWO LEVELS OF SOLUTION :

-Primary, consisting of infinite variety of whole-numbered Solutions,

,

-Secondary, consisting of infinite variety of Non-Whole-numbered solutions.

Non-Whole-numbered solutions of the system are functions of solutions of whole-numbered .

These solutions make infinite variety of irrational numbers , that make decisions of the famous equation:

(92) $$a^n+b^n=c^n$$

The basis of the system as it was shown above, are three first numbers of the natural numbers row, see (50). These three numbers make an amount :

(93) $$1+2=3$$

On which is base the principle of general (geometrical) co-variability by Pythagoras.
See also:
http://yvsevolod-27.narod.ru/index.html

Reference: This is a copy of the first page of my personal site .

Triads (a, b, c) in system (79) and in equation (92) are functions of natural row numbers , calculated with the help of simple formulas:

(94)
$$\left| \begin{aligned} a &= a_* \times S \\ b &= b_* \times S \\ c &= c_* \times S \end{aligned} \right.$$

In which S is any whole-numbered common multiplier, and triads of numbers (a_*, b_*, c_*) are solutions of infinite variety of basis equations , see Example 8 :

(95)
$$a_*^{\,n} + b_*^{\,n} = c_*^{\,n}$$

Solutions of these equations are calculated with the help of my formulas:

(96)
$$\left| \begin{aligned} a_* &= \sqrt[n]{a_0^{\,2} \times D_n} \\ b_* &= \sqrt[n]{b_0^{\,2} \times D_n} \\ c_* &= \sqrt[n]{c_0^{\,2} \times D_n} \end{aligned} \right.$$

At any whole-numbered $n \geq 2$

Here:

(97) $$D_n = (a_0^{n-2} + b_0^{n-2} + c_0^{n-2})/3$$

COMMON MULTIPLIER

Triads of numbers (a_0, b_0, c_0) are primitive Pythagoras triiads.
Primitive Pythagoras triads are calculated with the help of famous formulas:

(98) $$\begin{cases} a_0 = v^2 - u^2 \\ b_0 = 2vu \\ c_0 = v^2 + u^2 \end{cases}$$

In this formulas any pair of natural numbers is used :

(99) $$v > u$$

of different evenness .

Mathematical apparatus of my system of natural and irrational numbers looks like that.
Conclusion of this mathematical apparatus is given in my publications, information about which is in the end of this letter.
See also:
http://yvsevolod-28.narod.ru/index.html

I DEMOSTRATE EFFECTIVENESS OF THIS MATHEMATICAL APPARATUS ON DEFINITE EXAMPLE .
I take this example from the Internet, from your publication:
Prize offered for solving number conundrum
cached/more results from this site …

In this publication you give the following example:

(100) $$3^6 + 18^3 = 3^8$$

In which the role of common multiplier make number .
Example is equivalent to my example 2, having been described above.
In this example a common multiplier is not only number 3 but also a number

3^6 **with an exponent of degree n = 6 .**

LET'S CONTINUE RESEARCH OF THE SYSTEM (1) AND EQUATION (92) AT THIS EXPONENT OF DEGREE.

For that we extract an equation from the system:

(101) $$a^6 + b^6 = c^6$$

Using formulas (98) and making according to condition (99), Primary pair of numbers, composing view (83):

(102) $$\left| \begin{array}{l} v = 2 \\ u = 1 \end{array} \right.$$

We'll calculate PRIMITIVE (fundamental) Whole-numbered solution (98) of equation (101), that is a part of system (46):

(103) $$\left| \begin{array}{l} a_0 = v^2 - u^2 = 3 \\ b_0 = 2vu = 4 \\ c_0 = v^2 + u^2 = 5 \end{array} \right.$$

We see that the role of this solution takes first primitive Pithagorus triad . Analyzing mathematical models (94) – (99), it is easy to see,that whole numbered solution (102) , (103) and forms (82) , (83) is invariant of all equations (95) and (92) at any exponent of degree $n \geq 2$

This is a fundamental decision of primary level of numbers, forming the system (79), including equation (101) .

Let's come to the secondary level of numbers, that make whole-numbered solutions of the system (79),having grown from the primitive triad of natural numbers , see also Yarosh Theorem and it's proof,that is given above . Research of this phenomena of numbers theory is given on the definite equation (101), extracted from the system (79).

Using formulas (97) – (99), we calculate a common multiplier at

(104 $$\left| \begin{array}{l} n = 6 \text{ :} \\ D_6 = (3^4 + 4^4 + 5^4)/3 = 320{,}666666.... \end{array} \right.$$

And solution of basic equation (95) with the same exponent of degree n :

$$a_* = \sqrt[6]{3^2 \times 320,6666667} = 3,773254116$$

$$b_* = \sqrt[6]{4^2 \times 320,6666667} = 4,153003528$$

(105) $$c_* = \sqrt[6]{5^2 \times 320,6666667} = 4,473687434$$

(21)

Using primary forms (94) , we create infinite variety non-whole-numbered solutions of the equation (101).

FOR EACH EXPONENT OF DEGREE n EXISTS ITS OWN INFINITY OF VARIETY FOR SIMILAR DECISIONS.

Going backwards we will always come to primary condition (102), information about which is in view (55) of the Yarosh Theorem proof and in fundamental sum (59), containing in the basis of Principle of general (geometrical) co-variability of Pythagoras.
Hoping for your approval I give you additional information.
For the question stated by Mr. Andrew Beal «The mystery remains : is there an elementary proof?»

I have already answered and answer again:
Elementary solution of Fermat`s Last Theorem exists.
Such solution (analytical and geometrical) was published in 1993 in Moscow by «ENGINEER» publishing house as a book under title «DENOUEMENT OF MULTICENTURY ENIGMA OF DIOPHANT AND FEMAT» (The Great Fermat Theoren is finally proved for all n>2) , [8] , [9]. Formulas (94) – (97) are taken from that book.
One copy is available in library of USA Congress.
In the same 1993 above-mentioned elementary proof was published in collection of scientific works «Algorithms and structures of data development systems » by Tula State Technical University, [10].
Also in 1995 , in collection of scientific works under the same title In Tula State University was published my article under title «About some faulty statement in theory of numbers», in which it was proved that statement :
«If theorem is proved for n=4, there is no need to prove it for all even exponents of degree for Fermat equation» is faulty, [1].

More information about my proof you can find on my sites in the Internet :
http://yvsevolod-26.narod.ru//index.html ;
http;/yvsevolod-28.narod.ru/index.html ;

The value of my elementary proof is that they end with calculated formulas, supposed for calculation of infinite variety of solution of the Last theorem by P.Fermat ,theorems – hypothesis by A. Beal and theorem by V. Yarosh as a common phenomena of numbers theory.
This characteristic of my proof makes it absolutely different from publication «Wiles A. 1995. Modular elliptic curves and Fermat*s Last Theorem. Annals of Mathematics 141:443.» , See [4] .
Analyzing whole mathematical apparatus described in my letter, it's hard not to agree with Leopold Cronecker and Pythagoras.
Cronecker said:
«God created whole numbers. The others created by human»

Pythagoras knew structure of the Universe:
«The beginning of everything is one.. One as an account owns indefinite double. From one and indefinite double come numbers. From numbers come points. From points come lines.Flat figures come from them. From flat figures come volumetric figures. From them- sensed bodies»
The last statement is really astonishing. As all interacting particles - andrones- - are ruled by the low of conservation of quantum figures:

$$1 + 2 = 3$$

Description of this physical phenomena you can find on pages of my site : http://yvsevolod-26.narod.ru/index.html
in reference: «3m Phenomenon (Formerly unknown feature of collective behavior of elementary particles)».

Finally I'd like to mention the following phenomenon of human mind. A.Beal . as P.Fermat, is gifted with a nature of mathematical intuition, which helped him to formulate a unique rather soluble problem of figures theory without any mathematical constructions.

CONSEQUENCE

We have solution, look (79) – (86), equations :

$$A^x + B^y = C^z \qquad (a)$$

If

$$A^p x + B^q y = C^r z \qquad (b)$$

then we have solution of equations :

$$A^p + B^q = C^r \qquad (c)$$

as solution equations (a), if one takes into account that :

$$x = 1$$

$$y = 1$$

$$z = 1$$

For variable (x, y, z) we have equations (b) .

If

$$x = \text{INTEGER} \ \ K_x$$

$$y = \text{INTEGER} \ \ K_y$$

then we have equations (b), as equations :

$$A^p K_x + B^q K_y = C^r z \qquad \text{(d)}$$

From thes equations we derive the following formula for determining Z :

$$z = (A^P K_x + B^q K_Y) / C^r \qquad \text{(e)}$$

Bring to conformity :

$$x = (C^r K_z - B^q K_y) / A^P$$

$$y = \text{INTEGER} \ \ K_y$$

$$z = INTEGER \ \ K_Z$$

$$z = \text{INTEGER} \ \ K_z$$

and

$$y = (C^r K_z - A^p K_x) / B^q$$

$$x = \text{INTEGER} \ \ K_x$$

PART № 5

GENERAL CONSEQUENCE

It is 9 TYPS of positive whole numbers :

$\mathbf{N}$, $(v > u)$, (a_0, b_0, c_0) ,

$$(3F'_a, 3F'_b, 3F'_c), \ (A, B, C),$$

$$(x, y, z), (p, q, r), n, (X^*, A^*, B^*)$$

and following forms:

$$(a'_1\alpha'_1 + a'_2\alpha'_2 + a'_3\alpha'_3)/3F'_a = 1$$
$$(b'_1\beta'_1 + b'_2\beta'_2 + b'_3\beta'_3)/3F'_b = 1$$
$$(c'_1\gamma'_1 + c'_2\gamma'_2 + c'_3\gamma'_3)/3F'_c = 1$$

$$a_* = \sqrt[n]{F'_a}$$
$$b_* = \sqrt[n]{F'_b}$$
$$c_* = \sqrt[n]{F'_c}$$

$$F'_a = a'_1 \times \alpha'_1 = a'_2 \times \alpha'_2 = a'_3 \times \alpha'_3$$
$$F'_b = b'_1 \times \beta'_1 = b'_2 \times \beta'_2 = b'_3 \times \beta'_3$$
$$F'_c = c'_1 \times \gamma'_1 = c'_2 \times \gamma'_2 = c'_3 \times \gamma'_3$$

as equivalent of 9 secondary reduction forms of theory numbers by H.Poinkare :

$$S_1 = \begin{array}{l|} ha_1 \ldots ha_2 \ldots ha_3 \\ kb_1 \ldots kb_2 \ldots kb_3 \\ lc_1 \ldots lc_2 \ldots lc_3 \end{array}$$

$$a_1\alpha_1 + a_2\alpha_2 + a_3\alpha_3 = 1$$
$$a_1 = \beta_2\gamma_3 - \beta_3\gamma_2$$
$$a_2 = \beta_3\gamma_1 - \beta_1\gamma_3$$
$$a_3 = \beta_1\gamma_2 - \beta_2\gamma_1$$

Here (a, b, c) is endless series calculate roots

of equation by P.Fermat :

$$a^n + b^n = c^n$$

end

$$(X^*, A^*, B^*)$$

whole numbers for equations of non-modular elliptic curves :

$$Y^2 = (X^* - A^*) \times X^* \times (X^* + B^*)$$

Here numbers A^*

WILL NOT DIVIDE INTO / BY

$$16 = 4 \times (b_0 = 2vu) = 4 \times (b_0 = 2 \times 2 \times 1)$$

if v = 2 and u = 1 .

and

(A, B, C), whole numbers for system equations of A.Beal :

$$A^x + B^y = C^z$$

$$A^p x + B^q y = C^r z$$

WHISH HAVE MULTITUDE COMMON WHOLE MULTIPLYERS

Comment

According «Journal de l'Ecole Polytechnique,1882, Cachier 51, 45-91, part 12» :

S_1 is matrix of H.Poincare :

$$S_1 = \begin{vmatrix} a_1 h & a_2 h & a_3 h \\ b_1 k & b_2 k & b_3 k \\ c_1 l & c_2 l & c_3 l \end{vmatrix}$$

If $h = a_0{}^2$, $k = b_0{}^2$, $l = c_0{}^2$

then we have matrix :

$$S^*{}_1 = \begin{vmatrix} a_1 a_0{}^2 & a_2 a_0{}^2 & a_3 a_0{}^2 \\ b_1 b_0{}^2 & b_2 b_0{}^2 & b_3 b_0{}^2 \\ c_1 c_0{}^2 & c_2 c_o{}^2 & c_3 c_0{}^2 \end{vmatrix}$$

Here whole numbers (a_1, a_2, a_3) , (b_1, b_2, b_3) and (c_1, c_2, c_3) are mutually simple numbers, according of forms (71) – (73) .

Matrix S_1 have determinant :

$$\det S_1 = 1$$

Matrix $S^*{}_1$ have determinant :

$$\det S^*{}_1 = a_1(a_0{}^2 \times b_0{}^2 \times c_0{}^2) \times (c_2 b_3 - b_2 c_3) +$$
$$+ a_2(a_0{}^2 \times b_0{}^2 \times c_0{}^2) \times (c_3 b_1 - b_3 c_1) +$$
$$+ a_3(a_0{}^2 \times b_0{}^2 \times c_0{}^2) \times (c_1 b_2 - c_2 b_1) = 0$$

AS/OR

$$(c_2 b_3 - b_2 c_3) = (c_3 b_1 - b_3 c_1) = (c_1 b_2 - c_2 b_1) = 0$$

C O N S E Q U E N T L Y :

1)

According of form (37) ,

constituent part of $\det S^*{}_1$:

$$(a_0^{\,2} \times b_0^{\,2} \times c_0^{\,2}) =$$
$$= (X^* - A^*) \times X^* \times (X^* + B^*) =$$
$$= Y^2$$

IS EQUATIONS FOR NON - MODULAR ELLIPTIC CURVES
OF FIRST TYPE

2) According $\det S^*{}_1 = 0$ and according of forms (74), (68), (71) – (73) , we have calculate system equations :

$$(\beta'_2\,\gamma'_3 - \beta'_3\,\gamma'_2\,) = (c_2 b_3 - b_2 c_3) = 0$$
$$(\beta'_3\,\gamma'_1 - \beta'_1\,\gamma'_3\,) = (c_3 b_1 - b_3 c_1) = 0$$
$$(\beta'_1\,\gamma'_2 - \beta'_2\,\gamma'_1\,) = (c_1 b_2 - c_2 b_1) = 0$$

3) At last we have come to a finale :
According of form (39) we have :

$$(X^* - A^*) = a_0^{\,2}$$
$$X^* = b_0^{\,2}$$
$$(X^* + B^*) = c_0^{\,2}$$

as calculate solutions of equations for non-modular elliptic curves :

$$Y^2 = (X^* - A^*) \times X^* \times (X^* + B^*) =$$
$$= (a_0^{\,2} \times b_0^{\,2} \times c_0^{\,2})$$

Here numbers A^* will not divide into/by

$$16 = 4 \times (b_0 = 2vu) = 4 \times (b_0 = 2 \times 2 \times 1)$$
$$\text{if......}(v = 2)\text{......and.......}(u = 1)$$

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