THE THEOREM of DECOMPOSITION of MATERIAL NUMBERS. THE PROOF of FERMAT'S GREAT THEOREM. REGULARYTY of SPACE.

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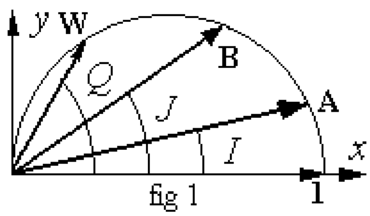
Разработаны правила векторной интерпретации положительных вещественных чисел в двухмерном пространстве. Доказана теорема разложения *(A+B=C)*. Доказана великая теорема Ферма (ВТФ). Сформулирована единая теорема разложения натуральных чисел для пространств различной мерности. Построена геометрическая модель физической системы координат трехмерного пространства. Ее параметры отличаются от параметров системы координат Декарта. Оценена возможность существования пространств различной мерности.

Blednov V. A. The vector interpretation rules of positive material numbers in two-dimensional space are developed. The theorem of decomposition (A + B=C) is proved. The Fermat's Great Theorem (FGT) is proved. The uniform theorem of decomposition of natural numbers for spaces of various regularity is formulated. Geometrical model of physical system of coordinates of three-dimensional space is constructed. Its parameters differ from parameters of system of Decart's coordinates. An opportunity of existence of spaces of various regularity is appreciated.

One-dimensional space (ODS). If the sequence algebraic numbers (AN) is interpreted in vector sizes (VS) then the sum AN of does not differ from the sum of VS: $\mathbf{A}_1 + \mathbf{A}_2 + \ldots + \mathbf{A}_n = \mathbf{B}$.

Two-dimensional space (TwDS). If the sequence AN is interpreted in BB, the numerical meanings AN should define as ratio between modules BB, and their mutual orientation. A sequence positive material AN is given: $A, B, \ldots, W, M$, where $A<B<,\ldots,W<M$ and equation: $X+Y+\ldots+Z=Q$. At vector interpretation, it is necessary to unit AN in uniform system, comparing their quantities with base numbers, which we count M or Q (maximum numbers): A/M, $B/M,\ldots$, W/M, 1; $X/Q+Y/Q+\ldots+Z/Q=1$.Concerning those numbers we shall define directions all other. We execute geometrical interpretation of numbers in the uniform metrics r: $\mathbf{A/M}$, $\mathbf{B/M},\ldots,\mathbf{W/M},\mathbf{1}$; $\mathbf{X/Q}+\mathbf{Y/Q}+\ldots+\mathbf{Z/Q}=\mathbf{1}$. We shall enter system of coordinates $x0y$. A vector **1** we shall direct along an axis x. On it as on a diameter we shall construct a semicircle. Directions of other vectors $|\mathbf{A}|=A/M,\ldots,|\mathbf{W}|=W/M$ we shall define from $A/M = CosI,\ldots,W/M = CosQ$: $I= arcCos\ A/M,\ldots$, $Q = arcCos\ W/M$. The rule: *vectors, received after interpretation, make with a vector* **1** *corners, determined from the relations* $A/M = CosI$, …, $W/M=CosQ$. They are projections of a vector **1**. *Each AN of a sequence contains the information on the module and direction appropriate to it BB*. If of a vector begin in one point (beginning of coordinates), a geometrical



place of their termination, will be a circle (fig. 1). **The theorem of decomposition** is proved: *if the decomposition A+B=C is given on positive material set, where* $A=a^n$, $B=b^n$, $C=c^n$, *then* $n=2p$, *where p – root of the equation:* $\arccos (a/c)^p + \arccos (b/c)^p = \pi / 2$. It is The Fermat's Great Theorem (FGT) on natural set.

The proof FGT. From the theorem of decomposition follows, that in decomposition $a^{2p}+b^{2p}=c^{2p}$, numbers $a, b, c, 2p$ are natural. From [1] follows, that numbers a, b, c – mutually simple, $2p$ – simple, and number a^p, b^p, c^p – whole. As $2p$ – number natural, p $(2p>1)$ either natural, or half-whole $p=s+ +0.5$, where s – natural number ($s\geq 1$). Is proved **lemma**: If in decomposition $a^{2p}+b^{2p}=c^{2p}$ of number $a, b, c, 2p, a^p, b^p, c^p$ natural, then number p also natural, and number $2p$ – even. If p natural, that $n=2p$ even. When $p = s + 0.5$, then numbers $a^p = a^s\sqrt{a}$, $b^p = b^s\sqrt{b}$, $c^p = c^s\sqrt{c}$ should be natural also. If it is carried out, there are the numbers $(a_1)^2=a$, $(b_1)^2=b$, $(c_1)^2=c$. Then $a^p = =(a_1)^{2s+1}$, $b^p=(b_1)^{2s+1}$, $c^p=(c_1)^{2s+1}$. Number $p=2s+1$ – natural, and number $2p$ – even. Is proved, that the parameter of a degree in FGT should be simultaneously number even and simple. Sole such number is 2, and $p=1$. *Proceeding from it, we believe FGT proved.*

The prospective proof, carried out P. Fermat. At first we shall formulate a consequence from Pythagor's theorem. This consequence, in our opinion, more than 350 years has back made, but has not published by P. Fermat: *if* $A+B=C$, *the numerical pieces* $\mathbf{A}^{1/2}$, $\mathbf{B}^{1/2}$, $\mathbf{C}^{1/2}$ *make a rectangular triangle* ($A^{1/2}=2mn$, $B^{1/2} = m^2 - n^2$, $C^{1/2} = m^2 + n^2$). If to read [1, for $n=4$] "between lines", it is possible to be convinced, that P. Fermat *proves impossibility of existence on natural set of a rectangular triangle, the parties of which are equal* x^2, y^2, z^2. Equality cannot be carried out: $x^2=2mn$, $y^2=m^2-n^2$, $z^2=m^2+n^2$, where m, n – mutually simple numbers of different parity. Identity $(2mn)^2 + (m^2-n^2)^2 = (m^2 + +n^2)^2$ – form of record of Pythagor's theorem, and the parties of any rectangular triangle are equal $x=2mn$, $y=(m^2-n^2)$, $z=(m^2+n^2)$. From a consequence of the of Pythagor's theorem follows, if $X+Y=Z$, the numerical pieces $\mathbf{x}, \mathbf{y}, \mathbf{z}$, received after geometrical interpretation of numbers $x=X^{1/2}$, $y=Y^{1/2}$, $z=Z^{1/2}$ make a rectangular triangle, where z – hypotenuse. Then $x/z=\cos\alpha$, $y/z=\sin\alpha$ and $\cos^2\alpha + \sin^2\alpha = 1$. Hence $x^2+y^2=z^2$. In researches for $n=4$ P. Fermat has actually proved the theorem: *on natural set the numerical pieces, received after geometrical interpretation of squares of numbers, cannot make a rectangular triangle;* $x^2 \neq 2mn$, $y^2 \neq m^2 - n^2$, $z^2 \neq m^2 + n^2$, *where m, n - mutually simple numbers of different parity*. If such rectangular existed,, according to the

Pythagor's theorem, equality $x^4 + y^4 = z^4$ was carried out. For the complete proof GFT it was necessary to establish, that the equality $x^q=2mn$, $y^q=m^2 - n^2$, $z^q = m^2 + n^2$ cannot be carried out at a parameter $q>2$, where $q= n^{1/2}$, and n – parameter of a degree of the equation $x^n + y^n = z^n$ and simple number. It follows from **lemma** [2]: Let a, b, c – such natural numbers, that takes place equality $ab = c^n$; numbers a and b are mutually simple. Then there are such natural numbers x and y, that $a=x^n$, $b=y^n$. According to lemma $x^q= m^q n^q$. Easily to show, that natural number x, at $q\neq 1$, cannot be submitted as $x=[2 m^q n^q]^{1/q}$. *It and has made P. Fermat, by carrying out the proof GTF.* We shall note, if he has published a consequence from the of Pythagor's theorem, the theory algebraic of numbers would have absolutely other history.

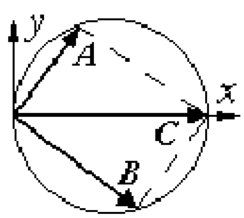


fig 2

The objects, forming physical space, are the same integral structures. In mathematics they can be submitted as natural numbers, equal to the sum also of natural numbers. In TwDS such structure is defined by the sum of vectors **A** + **B** = **C**, at which: $|\mathbf{A}|=a^2$, $|\mathbf{B}|=b^2$, $|\mathbf{C}| =c^2$. The total vector **C** is equal to the sum of two projections (greater quantity of projections it is impossible). Hence, GTF defines the sum of linearly independent vectors in two-dimensional space (fig. 2). Its major property: on natural set, change of the module of a vector **C** results not only in change of modules of linearly independent vectors **A** and **B**, but also their directions. It speaks about instability of physical system of coordinates in TwDS.

Three-dimensional space (**ThDS**). **The theorem**: *on set of positive natural numbers decomposition:* $a^n + b^n + c^n = d^n$, *where* $n \geq 3$, *solely:* $3^3 + 4^3+5^3= =6^3$. Its vector analogue determines a vector as the sum of three projections, given in some system of coordinates: **A**+**B**+**C**=**D**, where $|\mathbf{A}|=a^3$, $|\mathbf{B}|=b^3$, $|\mathbf{C}|= =c^3$, $|\mathbf{D}|=d^3$. From that theorem follows the three-dimensional space can be formed a sole type. On fig. 3 physical system of coordinates $0xyz$, appropriate the vector equation $\mathbf{3}^3 + \mathbf{4}^3 + \mathbf{5}^3= \mathbf{6}^3$ is shown. It is not orthodoxy, and this internal defines an opportunity of interaction between forces, working along physical axes of three-dimensional space. It has many of interesting properties, displayed simultaneously, that cannot be casual concurrence: **1**.The surface, where the vectors **A, B, C, D** is finished, is a sphere; **2**. Vectors **A, B, C** are projections of vector **D**, that

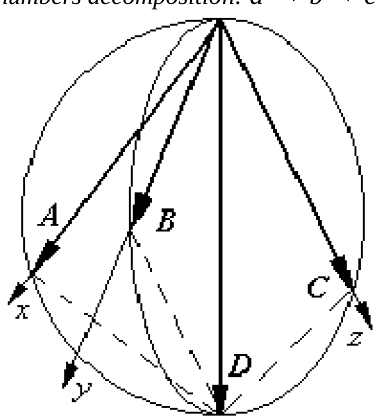


fig 3

coincides with a line of three crossing planes; **3**. The crossing planes make with each other identical corners equal $2\pi /3$; **4**. The corner between vectors **A** and **B** is equal $\pi / 2$; **5**. The sum of vectors **A** and **B** is equal to a vector **E**, the module of that is |**E**|=|**D**|; **6.** The vector **E** lays in one plane with a vector **C**; **7**. The beginning point of vectors **A**, **B**, **E**, and the points of they finish lay on one circle (four common points). In our opinion it is an initial element of three-dimensional space is which is named НЭЛЕТ (initial element of creature). From the theorem, made for three-dimensional space, follows, that its stability is maximum. It is provided at the expense of a difference energy. One of them gives a deduction in a given condition (*Wst*), another defines an energy, which is required for destruction of this structure (*Wdes*): *Wst* - *Wdes* = *Ws-d*. The energy Ws-d, which can destroy НЭЛЕТ, is huge. Besides after the discontinuance of its action НЭЛЕТ is restored. For the characteristic of stability of models of offered structures, describing elementary or initial structures substance, expediently to enter factor, which characterizes its stability: *B = Wdes/ Wst.*

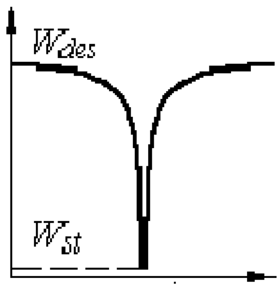


fig 4

Multi-dimensional space (**MDS**). **The theorem**: on set of natural numbers decomposition of a kind: $(a_1)^n+(a_2)^n+\ldots+(a_q)^n=b^n$, where $n=q$ and $n \geq 4$, does not exist. The vector of analogue of that theorem is $\mathbf{A}_1+\mathbf{A}_2+\ldots+\mathbf{A}q=\mathbf{B}$, where $|\mathbf{A}_1|=(a_1)^n$, $|\mathbf{A}_2|=(a_2)^n,\ldots, |\mathbf{A}q|=(a_q)^n$, $|\mathbf{B}|=b^n$, follows, that the vector, determining action of *indivisible structures* (for example, forces), cannot be equal a sum of components, each of which is a sum same *indivisible structures*. Therefore, the space, regularity of which more than three, do not exist.

We shall formulate the uniform theorem [3]: *the general theorem, where FGT is a special case only, is: On natural set the sum* $(a_1)^n+(a_2)^n+\ldots+(a_q)^n=b^n$ *has the following properties:* ***1****. If* $q\geq 1$*; at* $n=1$ *probably infinite quantity of variants of decomposition;****2****.If* $q=2$, $n\geq 2$*; at* $n=2$ *probably infinite quantities of decomposition; if* $n\neq 2$ *the decomposition is impossible (it is FGT);* ***3****.If* $q=3$, $n\geq 3$*; at* $n=3$ *probably sole decomposition:* $3^3 + 4^3 + 5^3 = 6^3$ *; for* $n>3$ *decomposition it is impossible;* ***4****. If* $q=n$, $n\geq 4$*; the decomposition is impossible.*

The literature

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