Impact Factor:

| | | | |
|---|---|---|---|
| ISRA (India) = 6.317 | SIS (USA) = 0.912 | ICV (Poland) = 6.630 |
| ISI (Dubai, UAE) = 1.582 | РИНЦ (Russia) = 3.939 | PIF (India) = 1.940 |
| GIF (Australia) = 0.564 | ESJI (KZ) = 8.771 | IBI (India) = 4.260 |
| JIF = 1.500 | SJIF (Morocco) = 7.184 | OAJI (USA) = 0.350 |

Issue Article

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) e-ISSN: 2409-0085 (online)

Year: 2023 Issue: 10 Volume: 126

Published: 15.10.2023 http://T-Science.org

**Aydin Yunis Isayev**
Azerbaijan State Agrarian University
PhD in technology, associate professor

**Vusala Siraj Zarbaliyeva**
Azerbaijan State Agrarian University
Head teacher

**Firudin Rashid Namazov**
Azerbaijan State Agrarian University
Assistant

**Leyla Aydin Ramazanova**
Azerbaijan State Agrarian University
Head teacher

**Gulnara Nadir Novruzova**
Azerbaijan State Agrarian University
Assistant
ORCID: 0000-0001-8290-0528

# 3rd ORDER TRANSIENT GEOMETRIC-GETTING NUMERICAL SERIES AND THEIR CHARACTERISTICS

***Abstract**: Here are the geometric and numerical series addition performed with the same number of thresholds and the 3rd order transitive geometric number of new number sequences obtained as a result of subtraction operations series organized by proved. At the same time this type of ridges its features have been studied.*

***Key words**: geometric and number series, limits, collection and exit, difference, multiply.*

***Language**: English*

***Citation**: Isayev, A. Yu., Zarbaliyeva, V. S., Namazov, F. R., Ramazanova, L. A., Novruzova, G. N. (2023). 3rd order transient geometric-getting numerical series and their characteristics. *ISJ Theoretical & Applied Science, 10 (126),* 333-339.

***Soi**: http://s-o-i.org/1.1/TAS-10-126-25 ***Doi**: crossref https://dx.doi.org/10.15863/TAS.2023.10.126.25

***Scopus ASCC**: 2600.*

## Introduction

**UOT 631.331.06**

It is known that a numerical sequence is such a sequence of numbers that, starting from the second limit, each of its limit from himself previous limit the same one of the number from the total is taken [1, 2]. other to the definition according to finite if the sequence of its first differences in the sequence remains constant ( $a_i - a_{i-1} = d$ ) , 1st compilation to this sequence number series it is said [3].

If $m$ - th of differences sequence stable has been ( $m - 1$ ) - th of differences sequence stable if not, then to sequence $m$ - th compilation number series it is said [3, 4]. This in definition record those who are common has been both name (1- c compilation), both too high compiled number ranges coverage does.

Appreciation according to geometric series so number is the sequence that the second too much starting with his each onelimit from himself previous limit ratio stable remains [1, 2].

The number and geometric ranges between connection about is reported that if $y_1, y_2, \dots, y_n$

**Impact Factor:**
ISRA (India) = 6.317 | SIS (USA) = 0.912 | ICV (Poland) = 6.630
ISI (Dubai, UAE) = 1.582 | РИНЦ (Russia) = 3.939 | PIF (India) = 1.940
GIF (Australia) = 0.564 | ESJI (KZ) = 8.771 | IBI (India) = 4.260
JIF = 1.500 | SJIF (Morocco) = 7.184 | OAJI (USA) = 0.350

the difference $d$ which is number is a series $x_1, x_2, \dots, x_n$ $q = a^d$, then $a^{x_1}, a^{x_2}, a^{x_3}, \dots$ sequence having an accent geometric is a series [4]. This the same based strength of the tops consistently as change contains does. $x_1, x_2, \dots, x_n$ Actually in question of the relationship $a > 0$, the difference $d$ the number of series with, stroke $q$ which is geometric series between connection that it is not it is obvious. Here new one of sequence $u_n$ purchase given. This sequence to work geometric series organize does. Y.N. Sukonnikin $u_n$ [5] investigation numerical-geometric which he called a series to sequence dedication has been done. Numerical-geometric series sequence has been in the recurrent case so given: $u_{n+1} = qu_n + d$, (1)
here q and d – are constants.

In the article it is said that numerical-geometric series special case $q = 1$ when $d = 0$ number series, when to work geometric is a series. This line up (1) initially in relation to $n = 1,2,3, \dots, q \neq 1, d \neq 0$ to be intended is held.

Numerical-geometric line up limit revealed formula is as follows:

$$u_{n+1} = q^n\left(u_1 + \frac{d}{q-1}\right) - \frac{d}{q-1}. \quad (2)$$

The same at the time numerical-geometric series 2nd compilation turning there was a sequence

$$u_{n+1} = (q+1)u_n - qu_{n-1} \quad (3)$$

equation with is given.

$$d = \frac{u_n^2 - u_{n-1}u_{n+1}}{u_n - u_{n-1}}$$

Numerical-geometric line up the difference so appointment is:

$$a_n = u_{n+1} - u_n \quad (4)$$

Submission which is numerical-geometric line up 2nd compilation turning sequence naming [5] it seems his first of differences sequence geometric series formation with is connected. This is numerical-geometric in the series (5) sequence, stroke q which is geometric is a series.

**The actuality of the subject.** Instead, on the same number of terms of the given geometric and numerical series addition and subtraction given Examining the geometric-numerical series obtained as a result of actions and Deriving the appropriate formulas for determining their main indicators of this field of science deepens and serves its development. The possibilities of applying the obtained results in various fields of science expands . This point of view topic is relevant.

**The purpose of the study.** Conducted on the same numbered limits of the given geometric and numerical series addition and subtraction geometric-numerical series consisting of new sequences obtained as a result of actions characteristics to investigate and key indicators certain is to do.

**Research object.** Conducted on the same numbered limits of the given geometric and numerical series transactions as a result received new are sequences .

**Research methods. Theoretical studies** of the same numerical limits of given geometric and numerical series on conducted transactions as a result received new of sequences characteristics to study service does.

**Materials and discussions**

With the direct participation of the limits and other important indicators of the given geometric and numerical series it is important to study the new sequences obtained . On limits of geometric and numerical series instead of collection made and exit received from operations of new sequences characteristics let's investigate.

**Theorem 1.** Given geometric and number line up and either number and geometric line up from the first a sequence consisting of the sum of the terms of the same number starting from constitutes a geometric-numerical series and his the second differences form a new geometric series. The product of this series is the given geometric seriesequal to the multiplication has been limits number to work two limit is less.

$$b_n = b_1 + d(n-1)$$

$$b_1 a_n a_1$$

Theorem from the condition it appears whom one geometric and one number series is given. Let's catch it that geometric series $a_n = a_1 q^{n-1}$, number series and formulas with is given here and $b_n$ – suitable $a_n$ the *nth* limit of geometric and numerical series ; and – respectively, geometric and numerical series first limit; $q$ – geometric series stroke; $d$ – the numerical sequence difference; $n$ – suitable series limits common is the number.

$a_1, a_2, \dots, a_n$

$b_1, b_2, \dots, b_n$

In the given formulas n=1,2,3... determine the corresponding limits of the corresponding series by writing the values make becomes I mean

geometric series hit $q$ , number series difference $d$ .

This of ridges the same No limits collecting the following sequence we get:

...,

$$g_1 = a_1 + b_1,$$
$$g_2 = a_2 + b_2 = a_1 q + b_1 + d,$$
$$g_3 = a_3 + b_3 = a_1 q^2 + b_1 + 2d$$
$$g_4 = a_4 + b_4 = a_1 q^3 + b_1 + 3d,$$

$$g_{n-2} = a_{n-2} + b_{n-2} = a_1 q^{n-3} + b_1 + d(n-3)$$
$$g_{n-1} = a_{n-1} + b_{n-1} = a_1 q^{n-2} + b_1 + d(n-2)$$
$$g_n = a_n + b_n = a_1 q^{n-1} + b_1 + d(n-1) \quad (6)$$

here $g_1, g_2$, ...., $g_n$, – geometric-numerical line up limits replaced expression; $n$ – both too geometric number line up limits is the number. $g_1, g_2$ $g_n$

Every two given from the ridges organize where for new sequence (7), for now conditional as,

geometric-numerical series ,..., let's call it

Now we determine the first differences of $d_{1,i}$ this series:

$$d_{1,1} = g_2 - g_1 = a_1 q + b_1 + d - a_1 - b_1 = a_1(q-1) + d,$$
$$d_{1,2} = g_3 - g_2 = a_1 q^2 + b_1 + 2d - a_1 q - b_1 - d = a_1 q(q-1) + d,$$
$$d_{1,3} = g_4 - g_3 = a_1 q^3 + b_1 + 3d - a_1 q^2 - b_1 - 2d = a_1 q^2(q-1) + d$$

...,

$$d_{1,n-3} = g_{n-2} - g_{n-3} = a_1 q^{n-3} + b_1 + d(n-3) - a_1 q^{n-4} - b_1 - d(n-4) = \\ = a_1 q^{n-4}(q-1) + d$$
$$d_{1,n-2} = g_{n-1} - g_{n-2} = a_1 q^{n-2} + b_1 + d(n-2) - a_1 q^{n-3} - b_1 - d(n-3) = \\ = a_1 q^{n-3}(q-1) + d$$
$$d_{1,n-1} = g_n - g_{n-1} = a_1 q^{n-1} + b_1 + d(n-1) - a_1 q^{n-2} - b_1 - d(n-2) = \\ = a_1 q^{n-2}(q-1) + d$$
$$d_{1,i} \qquad (7)$$

here $i = n-1$ – first of differences suitable limit price; $i$ – geometric-numerical line up first of differenceslimits is the number, .

First of differences (7) from the sequence use by doing (6) geometric-numerical of the ridge the second differences

$d_{2,m}$ Now we determine it:

$$d_{2,1} = d_{1,2} - d_{1,1} = a_1 q(q-1) + d - a_1(q-1) - d = a_1(q-1)^2 = v_1,$$
$$d_{2,2} = d_{1,3} - d_{1,2} = a_1 q^2(q-1) + d - a_1 q(q-1) - d = a_1 q(q-1)^2 = v_2$$

,...,

$$d_{2,m-1} = d_{1,n-2} - d_{1,n-3} = a_1 q^{n-3}(q-1) + d - a_1 q^{n-4}(q-1) - d = \\ = a_1 q^{n-4}(q-1)^2 = v_{m-1}$$
$$d_{2,m} = d_{1,n-1} - d_{1,n-2} = a_1 q^{n-2}(q-1) + d - a_1 q^{n-3}(q-1) - d = \\ = a_1 q^{n-3}(q-1)^2 = v_m$$
$$d_{2,m} - \qquad (8)$$

$m = i - 1 = n - 2$ second here of differences suitable limit price; $m$ – the second of differences in sequence of limitsis the number, .

$v_1, v_2, \dots, v_m$ (8)

in sequence $d_{2,1}, d_{2,2}, \dots, d_{2,m}$ and or limits is the number.

$m = n - 2$

Second of differences consisting of sequence, to the definition according to Yes having a number new geometricseries to be of the stroke for stable to be conditional must be paid . This of sequence hit find:

$$\frac{v_2}{v_1} = \frac{a_1 q(q-1)^2}{a_1(q-1)^2} = q, \dots,$$
$$\frac{v_m}{v_{m-1}} = \frac{a_1 q^{n-3}(q-1)^2}{a_1 q^{n-4}(q-1)^2} = q.$$

$v_1, v_2, \dots, v_m$

Received strokes equal to be shows that the second of differences sequence consisting of accented geometric line up stroke with is the same and of this series number of thresholds too

$m = n - 2$- is _ $m$

$n = m + 2$ in his statement $n$ - in by writing instead received new geometric line up limits so can be:

$v_1 = a_1(q-1)^2$, $v_2 = a_1 q(q-1)^2$,..., $v_m = a_1 q^{m-1}(q-1)^2$,

where $m$ =1,2,3,...by writing, $a_1$ and it is possible to set any limit according to the values of $q$ . Theorem 1 for received suitable geometric-numerical line up (6) nth _ limit so is written:

$$g_n = a_1 q^{n-1} + b_1 + d(n-1). \qquad (6a)$$

from the sequence new geometric line up m _ limit is as follows:

$$v_m = a_1 q^{m-1}(q-1)^2. \qquad (9a)$$

$g_1, g_2, \ldots, g_n$ (6) geometric-numerical of the ridge n-first limit total the following is like:

$$S_n = g_1 + g_2 + \cdots + g_n = a_1 + b_1 + a_2 + b_2 + \cdots + a_n + b_n = \frac{a_1(q^n-1)}{q-1} + \frac{b_1+b_n}{2}n$$

and either

$$S_n = \frac{a_1(q^n-1)}{q-1} + \frac{2b_1+d(n-1)}{2}n. \quad (10a)$$

New geometric the ridge $v_1, v_2, \ldots, v_m$, (9) sequence based on his $m$ - the first limit total to work the following whom appointment is done:

$$S_m = \frac{v_1(q^m-1)}{q-1} = a_1(q^m-1)(q-1). \quad (11)$$

**Theorem 2.** The given geometry line up starting with the first each one limit with given number a sequence consisting of the difference of the same numbered terms of the series constitutes a geometric-numerical series and itsthe second differences form a new geometric series. This series of the given geometric sequence equal to the multiplication has been limits number to work two limit is less.

As in Theorem 1, suppose a geometric series and $a_n$ numerical series $b_n$ given. Theorem condition according to given geometric series , from the first starting with each one extreme given number line up the same No limit if we leave received new sequence it happens like this:

$$\begin{aligned}
g_1 &= a_1 - b_1 = a_1 + (-b_1), \\
g_2 &= a_2 - b_2 = a_2 + (-b_2) = a_1 q + (-b_1 - d), \\
g_3 &= a_3 - b_3 = a_3 + (-b_3) = a_1 q^2 + (-b_1 - 2d) \\
g_4 &= a_4 - b_4 = a_4 + (-b_4) = a_1 q^3 + (-b_1 - 3d) \\
&,\ldots, \\
g_n &= a_n - b_n = a_n + (-b_n) = a_1 q^{n-1} + [-b_1 - d(n-1)].
\end{aligned} \quad (12)$$

(12) in sequence exit practical collection with being replaced theorem 1-in condition suitable as received. Then according to theorem 1 of the new sequence of (12). to organize a geometric-numerical series and his second consisting of differences of sequence to work new the formation of a geometric series is obtained. This the product of the series is the given geometric series hit is equal to and and the number of limits is given than that of the series two limit is low. This case too new geometric in series (9). which is like (6) and (12) of sequences spelling comparison if we do to see happens that only the difference (12) each in writing of the second summation for the limit opposite sign, that is, it is negative. (6) and (12) that the first collected ones of the geometric series in the corresponding limits of the sequences are the same, but number to the series belong which is the second of those gathered opposite marked to be at the expense of received geometric-numerical The limits of the series with the same number are different in price. It is clear from the above that the first of the sequence obtained after the addition operation performed on the limits of the given series and when determining their second difference, the indices of the numerical series are completely corrected, on the contrary, given geometric line up indicators to work new geometric the ridge they form.

These reasons, the same numbered terms of the geometric series and the same numbered terms of the numerical series collection on or the arithmetic sequence of the sequence obtained as a result of subtraction operations of being named based that it is shows.

New geometric line up done coming for before geometric-numerical line up first and the second differences need to be determined. The transition to a new geometric series is the second of the geometric-number seriesof differences after the head to give his 3 rd compilation transitive geometric-numerical series naming conditions .

If the limits and other indicators of the given geometric and numerical series are the same for both theorems if so, of the limits of the received geometric-numerical series prices will be different. Despite this, received new geometric of the series indicators absolutely the same happens.

Theorem 2 for received geometric-numerical line up (12) $n$ - th limit is as follows:

$$g_n = a_1 q^{n-1} - b_1 - d(n-1). \quad (12a)$$

This case received new geometry line up $m$ - th limit (9a) formula with statement is being $g_1, g_2, \ldots, g_n$

$$S_n = g_1 + g_2 + \cdots + g_n = a_1 - b_1 + a_2 - b_2 + \cdots + a_n - b_n = \frac{a_1(q^n-1)}{q-1} - \frac{b_1+b_n}{2}n$$

(12) geometric-numerical of the ridge $n$ - the first the sum of the limit so appointment is done:

and either

$$S_n = \frac{a_1(q^n-1)}{q-1} - \frac{2b_1+d(n-1)}{2}n. \quad (13)$$

New geometric the ridge $v_1, v_2, \ldots, v_m$, (9) sequence based on his $m$ - the first limit total theorem in 1 (11) formula with appointment we do

**Theorem 3.** Given number line up from the first starting with each one limit with given geometric The sequence consisting of the difference of the same numbered terms of the series constitutes a geometric-numerical series and its the second differences form a new geometric series. This series of the given geometric sequence is equal to the product and the sign of its limits changes oppositely, and the number of its terms is two less. For example, number series $a_n$ and $b_n$ geometric series is given. According to the condition of the theorem, the given numerical sequence , starting from the first, each one if we subtract the same numbered limit of the given geometric series from the limit received new sequence so can:

$$g_1 = b_1 - a_1 = b_1 + (-a_1) = -a_1 + b_1,$$
$$g_2 = b_2 - a_2 = b_2 + (-a_2) = -a_2 + b_2 = -a_1 q + b_1 + d,$$
$$g_3 = b_3 - a_3 = b_3 + (-a_3) = -a_3 + b_3 = -a_1 q^2 + b_1 + 2d$$
$$g_4 = b_4 - a_4 = b_4 + (-a_4) = -a_4 + b_4 = -a_1 q^3 + b_1 + 3d$$
$$,...,$$
$$g_n = b_n - a_n = b_n + (-a_n) = -a_n + b_n = -a_1 q^{n-1} + b_1 + d(n-1). \quad (14)$$

(14) sequence also, in (12). as in the subtraction operation replaced by summation, theorem Received in accordance with the condition of 1. Then (14) makes the new sequence a geometric-numerical series and sequence consisting of its second difference and forms a new geometric series. Previous in this series in theorems from those received the difference his of the sign of limits of the given on the contrary change.

For example, for the considered case, if the limits of the given geometric series have a positive sign , the new geometric line up limits sign on the contrary, it will change and negative will be.

Thus, it consists of the second difference of the geometric-numerical series obtained under the conditions of theorem 3 the sequence also forms a new geometric series. The product of this series to the product of the given geometric series is equal to limits sign on the contrary changes, limits number to work two limit is less.

New geometric line up limits (14) and (9) entries suitable as so can be:

$$v_1 = -a_1(q-1)^2,$$
$$v_2 = -a_1 q(q-1)^2$$
$$,...,$$
$$v_m = -a_1 q^{m-1}(q-1)^2, \quad (15)$$

here $m = 1,2,3,...$, known $a_1$ and of $q$ _ relevant prices suitable (15) new geometricof the ridge any limit appointment make possible.

Theorem 3 for received suitable geometric-numerical line up (14) $n$ - th limit so is written:

$$g_n = -a_1 q^{n-1} + b_1 + d(n-1). \quad (14a)$$

New geometric $m$ - th of the series limit to (15). suitable as such statement is:

$$v_m = -a_1 q^{m-1}(q-1)^2. \quad (15a)$$

$g_1, g_2, ..., g_n$

$$S_n = g_1 + g_2 + \cdots + g_n = -a_1 + b_1 - a_2 + b_2 - \cdots - a_n + b_n =$$
$$= \frac{-a_1(q^n - 1)}{q-1} + \frac{b_1 + b_n}{2} n$$

(6) geometric-numerical of the ridge n-first limit total so is taken:

and either

$$S_n = \frac{-a_1(q^n - 1)}{q-1} + \frac{2b_1 + d(n-1)}{2} n \quad (16)$$

New geometric the ridge $v_1, v_2, ..., v_m$ , (15) sequence based on his $m$ – the first limit total so appointment we do:

$$S_m = \frac{v_1(q^m - 1)}{q-1} = -a_1(q^m - 1)(q-1). \quad (17)$$

**Example 1.** If of each number of thresholds 6, stroke q=3 which is geometric series

2, 6, 18, 54, 162, 486 and given a numerical sequence with difference d=2 3, 5, 7, 9, 11, 13 the 3rd set of transition geometric-numerical series obtained by collecting the terms with the same number starting from and new geometric line up limits and of the latter hit appointment do it

According to the condition of the example, by performing the summation of the limits , the 3rd arrangement is a transitive geometry. number line up limits appointment we do:

5,11,25,63,173,499. (M1)

Geometric-numerical line up (M1) first differences we find:

$$d_{1,1} = 6, d_{1,2} = 14, d_{1,3} = 38, d_{1,4} = 110, d_{1,5} = 326.$$

First of differences 6, 14, 38, 110, 326 sequence based on geometric-numerical of the ridge the second differencesappointment we do:

$$d_{2,1} = 8, d_{2,2} = 24, d_{2,3} = 72, d_{2,4} = 216.$$

Second of differences

8, 24, 72, 216 (M2)

sequence new geometric series that it is certain make for his hit we find:

$$q_1 = 24:8 = 3, q_2 = 72:24 = 3, q_3 = 216:72 = 3.$$

Received strokes equal to be with geometric-numerical of the ridge the second of differences consisting ofof sequence stroke q=3 which is new geometric series which is certain was done.

$m = n - 2 = 6 - 2 = 4$ (9a) formula based on too new geometric line up limits certain let's:Limits being the number

$$v_1 = 2 \cdot 1 \cdot 4 = 8, v_2 = 2 \cdot 3 \cdot 4 = 24, v_3 = 2 \cdot 9 \cdot 4 = 72, v_4 = 2 \cdot 27 \cdot 4 = 216$$

is taken.

**Example 2.** Based on the conditions of Example 1, the same number of the same number of the geometric series is the same number of the numerical series the limits of the 3rd set of commutative geometric-numerical series obtained by subtracting the limit of number and this series the second of differences consisting of sequences new geometric line up limits and set the stroke do it

First give an example condition suitable as the 3rd compilation transitive geometric-numerical line up limits appointment we do:

–1, 1, 11, 45, 151, 473. (M3)

Geometric-numerical of the ridge (M3) first differences we find:

$d_{1,1} = 2, d_{1,2} = 10, d_{1,3} = 34, d_{1,4} = 106, d_{1,5} = 322.$

First of differences 2, 10, 34, 106, 322 sequence based on geometric-numerical line up the second differencesappointment we do:

$d_{2,1} = 8, d_{2,2} = 24, d_{2,3} = 72, d_{2,4} = 216.$

The product of the new geometric series (M2) obtained since the values of the second differences are the same as in example 1 ,limits number, also other prices there too same as received will be.

**Example 3.** If each the number of terms of one 5, the difference d=3 which is number series

3, 6, 9, 12, 15 and the geometric series with the term q=3 5, 15, 45, 135, 405 is given, then the numerical series, Starting from the first, the same number of the geometric series from the end of the same number taken if we exceed the limit 3 rd compilation transitive geometric-numerical line up limits and new geometric line up limits and hit appointment do it

For example condition suitable as, of limits deduction instead of giving geometric-numerical line up limits appointment we do:

-2, -9, -36, -123, -390. (M4)

Geometric-numerical of the ridge (M4) first differences we find:

$d_{1,1} = -7, d_{1,2} = -27, d_{1,3} = -87, d_{1,4} = -267$ .

First of differences -7, -27, -87, -267 sequence based on geometric-numerical line up the second differencesappointment we do:

$d_{2,1} = -20, d_{2,2} = -60, d_{2,3} = -180$ .

Second of differences

-20, -60, –180 (M5)

sequence new geometric series that it is certain make for his hit we find: $q_1 = 3, q_2 = 3, q_3 = 3.$

A sequence consisting of the second differences of a geometric-numerical series with the received points being equal It is certain that there is a new geometric series with variable q=3, opposite sign and different values was done.

$m = n - 2 = 5 - 2 = 3$

Based on the formula (15a), let's determine the limits of the new geometric series:Limits being the number

$v_1 = -5 \cdot 1 \cdot 4 = -20, v_2 = -5 \cdot 3 \cdot 4 = -60, v_3 = -5 \cdot 9 \cdot 4 = -180$

is taken.

**The result**

1. Studies have shown that **v** given geometric and numerical series, starting from the first one, are the samea sequence consisting of the sum of the terms of no The 3rd arrangement forms a commutative geometric-numerical series and his the second differences form a new geometric series. The product of this series is the given geometric seriesequal to the multiplication has been limits number to work two limit is less.

2. It is established that with each term of the given geometric series, starting from the first one the sequence consisting of the difference of the same numbered terms of the given numerical series, the 3rd arrangement, transitive geometryconstitutes a number series and its the second differences form a new geometric series. This series stroke given geometric line up hit equal to and the number of limits two terms less.

3. It has been proven that given given by each term of the numerical series, starting from the first one The sequence consisting of the difference of the same numbered terms of the geometric series is the 3rd set of transitive geometric constitutes a number series and its the second differences form a new geometric series. This series whose product is equal to the product of the given geometric series, and the sign of its terms changes oppositely, the terms ofnumber to work two limit is less.

4. Given geometric and number ridges, from the first starting with the same No limits on conducted collection and exit deeds as a result received new of sequences 3 rd compilation transitive naming the geometric-numerical series is justified . For the formation of a new geometric series first, it is necessary to determine the first and second differences of the geometric-numerical series. New geometry the transition to the series occurs after the second differences of the geometric-numerical series , its 3rd arrangement transitive geometric-numerical naming the series conditions .

**The novelty of the research work.** It has been proved that if a given *m* number of 1- If we multiply the terms of the same numbers of the number series, then the new sequence of numbers obtained *The m* - th arrangement forms a number series. For the first time, the general difference of high-order numerical series and the 2nd compilation number line up n-first limits of the total formulas removed .

**Importance of research work.** The obtained results can be included in the textbooks of the respective schools. Various science in the fields number sequence with connected with issues related conducted research in their work, of researchers math knowledge service to enrichment who did math is a device.

**Research of work economic effect.** Instead given investigation theoretical importance occupation does and the specific scientific-research work used to enrich the researcher's knowledge conclusion as a result own the opposite find can

**References:**


1. Mardanov, M.C., Yagubov, M.H., Mirzayev, S.S., et al. (2007). *Algebra: 9th grade of secondary schools for textbook.* (p.256). Baku: Chasioglu.
2. Vygodsky, M. Ya. (1975). *Directory po elementary mathematics*. (p.416). Moscow: Science.
3. Bronstein, I. N., & Semendyaev, K. A. (1980). *Directory po mathematics: For engineers i students vtuzov (perevod s nemeckogo).* Edition processed pod editor G. Groshe i V. Ziglera. (p.976). Moscow: Science.
4. (n.d.). *wiki Arithmetic progression - Wikipedia.* Retrieved from https://ru.m.wikipedia.org
5. Sukonnik, Ya. N. (1975). Arithmetico-geometric progression. *Quantum* , 1975, No. 1.
6. (2020). *Industry of Azerbaijan. Statistical compilation*. (p.276). Baku: DSK.
7. (2019). *Collections of SOCAR's main technical and economic indicators for 2015-2019*.
8. Huseynov, A.G. (2021). *Oil and environmental security: realities and prospects*. (p.434). Baku.
9. Aliyev, M., Huseynov, A., et al. (2016). *Economy and management of the oil and gas industry*. (p.553). Baku.
10. Safarov, G.A., & Mammadova, M.B. (2014). *Resources for increasing production efficiency in oil and gas extraction*. (p.384). Baku.
11. Ganciyev, G. (2007). *b. b. Transnational Corporations.* (p.192). Baku.