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APPLICATION OF NUMERICAL SEQUENCES IN ECONOMICS.

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ANNOTATION: This article focuses on the use of numerical sequences in economics. Analysis of economic processes and their planning requires the use of mathematical tools. Also, many people have heard of arithmetic progression, but not everyone can interpret it in economics. Arithmetic progression is used to model economic processes that have a tendency to constantly increase and decrease. Not only arithmetic progression, but also geometric progression can be used in economics. The geometric progression section also presents methods for finding the terms of the geometric progression studied in the section and methods for finding the sum of the terms of their formulas. The importance of numerical sequences, progressions and their microeconomic analysis, as well as operations in business planning, is also covered. Numerical sequences are an important tool for understanding the dynamics of economic growth and effective management. The application of numerical sequences to economics can be expressed in the following way: there are formulas for finding interest rates on loans from banks and loan amortizations. Two different methods are used to calculate these interest rates. They are arithmetic progression for simple interest, and geometric progression for compound interest. This process can be called debt amortization in short. In debt amortization, it can also be used to find the percentage of the remaining balance of a loan from a bank, variable interest rates, and the amount of interest that remains after the loan is paid.

Keywords: numbers, percentages, geometric progression, arithmetic sequence, formula, example, microeconomic analysis.

INTRODUCTION

Today, great attention is paid to the field of mathematics not only in our country, but also in foreign countries. Currently, there are several presidential decrees and laws aimed at developing and supporting mathematics. In particular, the presidential decree “On measures to improve the quality of education and develop scientific research in the field of mathematics” was adopted. At the same time, from September 1, 2021, it is mandatory for mathematics teachers in specialized schools to have a national certificate of the appropriate level. In 2020-2022, work was carried out to develop a program of measures for training highly qualified personnel in mathematics for economic sectors and the social sphere. In accordance with the Resolution of the President of the Republic of Uzbekistan No. PQ-4708 dated May 7, 2020, the financing of the activities of the Laboratory "Coordination of Educational and Methodological Materials for Mathematics Education" is carried out from the funds of the State Budget of the Republic of Uzbekistan within the funds allocated for the maintenance of the Institute. A laboratory for the coordination of teaching and methodological materials for mathematics education, consisting of 5 staff units, was established within the Institute. The Ministry of Finance of the Republic of Uzbekistan, the Ministry of Innovative Development and the Academy of Sciences approved the proposal of the President of the Republic of Uzbekistan to establish the Muhammad al-Khwarizmi International Prize in order to reward scientists who, based on the results of fundamental and applied scientific research in the field of mathematics, have proposed a solution to a specific problem in practice.

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In Uzbekistan, the introduction of modern pedagogical technologies for the formation of early mathematical ideas in preschool children, the development of specialized schools in the regions, and the establishment of new schools are considered a priority. In accordance with this, the President of the Republic of Uzbekistan adopted a resolution "On measures to improve the quality of education and develop scientific research in the field of mathematics". In accordance with this resolution, by November 1, 2020, specialized schools for in-depth teaching of mathematics (Specialized Schools) will be gradually established in each district (city). According to the presidential decree, in order to improve the quality of education in mathematics in Uzbekistan, specialized schools for mathematics will be established in each district. A national certification system for assessing the level of knowledge of mathematics has been introduced. An international award named after Muhammad Al-Khwarizmi has also been established, and its winners will be awarded 50 thousand dollars.

Methodology

There are three types of numerical sequences. They are divided into arithmetic, geometric and arbitrary progressions. An arbitrary sequence, a sequence based on a certain rule, is called an arbitrary sequence. A sequence formed by adding the same number is called an arithmetic sequence. When finding the last progression, that is, a geometric progression, it is called a progression formed by multiplying the same number. When finding the interest rate on a loan from a bank, these progressions are used depending on simple or compound interest. In particular, if the interest on the money received is in simple interest, it can be calculated arithmetically, and if it is in compound interest, it can be calculated in geometric progression. Many people have not yet come across the concept of interest. Interest is the fee we use. Debt amortization is the repayment of a loan taken in several periods at equal intervals. Financial rent is of two types. The principal payment of the loan and the interest payment for the remaining balance.

1. Arithmetic sequence:

In an arithmetic sequence, each subsequent element is formed by adding or subtracting a certain number from the previous one. For example, here each number is increased by 3 from the previous one. The general formula for such a sequence is:

1. $a_n = a_1+(n-1)d$ Finding the nth term of an arithmetic progression
2. $d=a_2-a_1$ d ni topish
3. $S_n = \frac{a_1+a_n}{2} \times n$ Finding the solution of all terms
4. $s_n = \frac{2a_1+(n-1)d}{2} \times n$ Finding the solution of all terms
5. $a = \frac{a_{n-k}+a_{n+k}}{2}$ find the median of a

2. Optional sequence:

This sequence is a special sequence in which each element is equal to the sum of the previous two elements. Numerical sequences are the main tool for solving various mathematical problems. Their various forms and areas of application are multifaceted and are important in the development of mathematical thinking. Understanding and applying the properties of each type of sequence in practice helps to achieve success in any field. The following inequality is proved for arbitrary natural numbers n:

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In arithmetic progression 1) if a_1=2,d=3 if a_{15} = find the. If a_1=-3
d= -2 ifa_{18}= find the $a_n=a_1+(n-1)*d$
Solving: a_1=2 d=3 a_{15}=2+(15-1)*3=2+42=44
a_1= -3 d= -2 a_{18}= -3+(18-1)*(-2)= -35
Depreciable value is the sum of the initial (replacement) cost of an asset as stated in the financial statements, less the expected (estimated) residual value. For fixed assets, the initial cost is the depreciable value increased by the amount of costs for additional construction, provision of additional equipment, reconstruction, modernization, technical re-equipment, and after the completion of these works, the residual (balance sheet) value of these fixed assets, determined at the time of their commissioning, minus the expected (estimated) residual value. Depreciation is a value expression of depreciation in the form of a systematic distribution and transfer of the depreciable value of an asset over its useful life to the cost of products (works, services) or period costs, based on the function of the fixed assets; For example, we also use a numerical sequence to draw up a debt amortization schedule. Example 1. At the beginning of the year, Ahmed borrowed 40,000 soums from a bank at an annual interest rate of 50%. Determine the interest payments on the debt and the debt amortization for each quarter?

Stages of Debt Repayment (t)	**Loan Amount (K)**	**Interest Rate (R%)**	**Interest Payment Amount (I_t)**	**Payments on the Principal Loan Amount (K_0)**	**Quarterly Contribution (K_0+I)**
1	40000	12.5%	5000	10000	15000
2	30000	12.5%	3750	10000	13750
3	20000	12.5%	2500	10000	12500
4	10000	12.5%	1250	10000	11250
Jami	-	-	12500	40000	52500

A company's revenue, profit, and expenses are plotted as a series of numbers over time. This data is analyzed in depth to determine their growth dynamics and make strategic decisions. If a company's revenue increases by 105% year over year, this forms a geometric progression. This information can be used to predict how much the company's revenue will be in future years. The actions of consumers and producers shape supply and demand. This process is often modeled through series of numbers. If the demand for a certain product increases year over year, its price will also increase accordingly. Mathematical models construct supply and demand curves, which help to understand how the equilibrium price is formed in the market.

Results

There are many formulas used in numerical sequences. For example, one example based on this formula will be considered: d=a2-a1 Finding d
a1=8 a2=10 d=10-8=2 In this example, the next term is found by adding 2 to the arithmetic progression. a1=8 a2=10 a3=12 a4=14 a5=16.

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Stages of Debt Repayment (t)	Loan Amount (K)	Interest Rate (R%)	Interest Payment Amount (I_t)	Payments on the Principal Loan Amount (K_0)	Quarterly Contribution (K_0+I)
1	60 mln	5%	3mln	15 mln	18mln
2	45 mln	5%	2.25mln	15mln	17.5mln
3	30 mln	5%	1.5 mln	15mln	16.5mln
4	15 mln	5%	0.75 mln	15mln	15.75mln

Conclusion

Number sequences are very important in economics for analyzing data, making predictions, and making optimal decisions. Banks and other credit institutions accumulate money in their hands with the condition of paying interest to its owners. A loan is understood as a relationship in which the funds that are temporarily idle in the hands of their owners are borrowed by others for a certain period, with the condition of paying interest. The time period over which the interest rate is calculated is understood as the compound interest period. The compound interest period can be divided into compound interest integrals. If the initial debt is considered unchanged and the compound interest is calculated for a specific period, then the simple interest rate is used. This simple interest rate is calculated using an arithmetic progression, and this type of calculation is presented in this article. In addition, geometric progression is also used for compound interest. Today, it was announced that these directions are an effective and clear way to avoid creating difficulties for bank employees.

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