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THE USE OF MATHEMATICAL PACKAGES IN TEACHING STUDENTS OF ECONOMICS

Anatation

The role of application packages in education is great, including in the study of mathematics. By facilitating the solution of complex problems, they remove the psychological barrier in the study of mathematics and make this process interesting and simpler. With proper application of them in the educational process, the packages provide an increase in the level of fundamentality of mathematical education. The article discusses the use of the Maple mathematical package in solving economic problems.

Keywords: mathematical packages, Maple, percentages.

ИСПОЛЬЗОВАНИЕ МАТЕМАТИЧЕСКИХ ПАКЕТОВ В ОБУЧЕНИИ СТУДЕНТОВ ЭКОНОМИЧЕСКИХ СПЕЦИАЛЬНОСТЕЙ

Анатация

Велика роль пакетов прикладных программ в образовании, в том числе, при изучении математики. Облегчая решение сложных задач, они снимают психологический барьер в изучении математики и делают этот процесс интересным и более простым. При грамотном применении их в учебном процессе пакеты обеспечивают повышение уровня фундаментальности математического образования. В статье рассматривается применение математического пакета Maple в решении экономических задач.

Ключевые слова: математические пакеты, Maple, проценты.

IQTISODIY IXTISOSLIK TALABALARIGA DARS BERISHDA MATEMATIK PAKETLARDAN FOYDALANISH

Anatatsiya

Ta'limda matematikani o'rganishda amaliy dasturlar paketlarining o'rni katta. Murakkab masalalarni yechishda yordam berish orqali ular matematikani o'rganishdagi psixologik to'siqni olib tashlaydi va bu jarayonni qiziqarli va sodda qiladi. O'quv jarayonida to'g'ri qo'llash bilan matematik paketlar matematik ta'limning fundamentallik darajasini oshirishni ta'minlaydi. Maqolada iqtisodiy masalalarni yechishda Maple matematik paketidan foydalanish muhokama qilinadi.

Kalit so'zlar: matematik paketlar, Maple, foizlar.

Introduction. From targeted training and education to the comprehensive preparation of the student for professional activities and self-realization. Mathematical programs make it possible to implement by standard means the most important principles from a didactic point of view "From simple to complex" and "Maximum visibility and convenience of work." These principles develop and form in students the skills of independent cognitive activity necessary for further education at a university. Let us consider in more detail on the example of an economic problem.

Literature review. Information culture includes knowledge of sciences that allow developing and adapting available information to a certain type of activity. A mandatory attribute of information culture is knowledge of modern information technologies, the ability to use them to perform both monotonous actions both in automatic mode and in non-standard situations. ([2], p. 3)

The study of information culture helps a person to truly realize his purpose in this world. Experts are of the opinion that in order to achieve a high level of information culture, it is not necessary to focus on memorizing information. ([3], p. 1)

It is more important to help create a new specialist for the information society who has certain skills: to find important information, to form criteria for data analysis, to use them correctly. Until now, there were no flagship Uzbek universities that create modern trends in the field of scientific

methodology and education, leading other universities of higher education. ([4], p. 73)

At the stages of development of the higher education system, the demand for "third generation" universities (business ecosystems, promising technology markets and ensuring the competitiveness of our national economy at the international level) is growing. ([5], p. 28)

To this end, it is planned to gradually introduce the concept of "University 3", which provides for the interdependence of commercialization of the results of education, science, innovation and research in higher education universities.

Research Methodology. Let's say you opened a bank account and deposited a certain amount, called the principal amount or capital. If the contribution is made for a certain time - a period, then after this time the income from capital, called interest money or interest, is added to the principal amount. If the deposit is made for an indefinite period, then capital income is accrued all the time, but the methods of accrual depend on the agreement with the bank.

The ratio of interest to principal is called the rate of interest. This value is most often expressed as a percentage.

According to similar rules, not only bank deposits can grow, but also other values, for example, population. Therefore, we will consider the situation with finances in more detail. (for example, month, quarter, or year). Let P_0 be the principal amount of the bank deposit, R the rate of interest for one period

Interest that is calculated only on the principal amount and is paid at the end of the period is called simple interest. In this case, the contribution is always increased by the amount of $P_0R/100$, i.e. at the end of the first period it will be

$$P_1 = P_0 + P_0 R/100 = P_0 (1 + R/100)$$

after two periods

$$P_2 = P_1 + P_0 R/100 = P_0 (1 + R/100) + P_0 R/100 = P_0$$

$(1 + 2R/100)$.

After n time periods, the contribution will increase to the value

$$P_n = P_0 (1 + nR/100)$$

The essence of compound interest calculations is that the interest accrued in the current period will be added to the principal amount in the next period, as a result, interest will be accrued both on the principal amount and on the money added in the previous period.

Let's assume that the bank put P_0 sum., And R is the rate of compound interest for one period (month, quarter,

year). Then the contribution at the end of the first period will be

$$P_1 = P_0 + P_0 * R/100 = P_0(1 + R/100)$$

after two periods

$$P_2 = P_1 + P_1 * R/100 = P_1(1 + R/100) = P_0(1 + R/100)$$

$(1 + R/100) = P_0(1 + R/100)^2$ etc.

After n time periods, the contribution will increase to the value

$$P_n = P_0(1 + R/100)^n$$

The resulting equation is called the compound interest formula.

From this relation we can find P_0 , n , R

Consider the problem

You have a choice: put 1,000,000 sum. on a deposit with a simple interest (at a rate of 12%) or compound (at a rate of 10%). Which investment is more profitable?

The growth of the contribution over, for example, the next six periods, we calculate according to the corresponding formulas (1) and (2):

```
> restart :
> СложныйПроцент := (P0, x, n) -> P0 * (1 + x/100) ^ n ;
ПростойПроцент := (P0, x, n) -> P0 * (1 + (x/100) * n) ;

СложныйПроцент := (P0, r, n) -> P0 * (1 + 1/100 * r)^n
ПростойПроцент := (P0, r, n) -> P0 * (1 + 1/100 * r * n)

> seq(СложныйПроцент(1, 10, i), i=1..6) :
evalf(%, 8) ;

1.10000000, 1.21000000, 1.33100000, 1.46410000, 1.61051000, 1.77156100

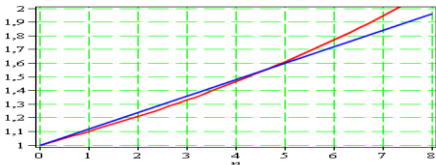
> seq(ПростойПроцент(1, 12, i), i=1..6) :
evalf(%, 8) ;

1.12000000, 1.24000000, 1.36000000, 1.48000000, 1.60000000, 1.72000000
```

Analysis and results. We see that the first four periods bring a large profit from a contribution with a simple interest, and starting from the fifth - with a complex one.

For clarity, let's use Maple to plot graphs of functions that determine simple (12%) and compound (10%) interest:

```
> with(plots) :
gr1:=plot(СложныйПроцент(1, 10, n), n=0..8, color=red) :
gr2:=plot(ПростойПроцент(1, 12, n), n=0..8, color=blue) :
display([gr1, gr2], view=[0..8, 1..2], axes=boxed,
thickness=2, axis=[gridlines=[10, color=green, linestyle=3]]) ;
```



Conclusion. The corresponding conclusion can be drawn from the graph.

We see that the first four periods bring a large profit from a contribution with a simple interest, and starting from

the fifth - with a complex one. The use of mathematical packages for students of economics should be a necessity in the educational process.

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THE UPBRINGING OF A PERFECT GENERATION AS AN IMPORTANT FACTOR IN INCREASING THE EFFECTIVENESS OF EDUCATION

Annotation

In the article, the mature generation should not be consumers, but creators and devotees of our modernized society, the main tasks of pedagogues and thoughts on conducting training on the process of personal development with students are described.

Key words: Happiness, positive virtue, ideal person, perfect person, sense of pride, intelligence, growth, reading, new way of thinking, comfortable living in new Uzbekistan.

ВОСПИТАНИЕ СОВЕРШЕННОГО ПОКОЛЕНИЯ КАК ВАЖНЫЙ ФАКТОР ПОВЫШЕНИЯ ЭФФЕКТИВНОСТИ ОБРАЗОВАНИЯ

Абстракт

В статье зрелое поколение должно быть не потребителями, а творцами и подвижниками нашего модернизированного общества, описаны основные задачи педагогов и мысли по проведению тренингов по процессу личностного развития со студентами.

Ключевые слова: Счастье, положительная добродетель, идеальный человек, совершенный человек, чувство гордости, интеллект, рост, чтение, новое мышление, комфортная жизнь в новом Узбекистане.

BARKAMOL AVLOD TARBIYASI TA'LIM SAMARADORLIGINI OSHIRISHNING MUHIM OMILI SIFATIDA

Annotatsiya

Maqolada barkamol avlod – yangilanayotgan jamiyatimizni iste'molchisi emas, balki yaratuvchisi va fidoyisi bo'lishi kerakligi, bunda pedagoglarning asosiy vazifalari va o'quvchilar bilan shaxsni barkamollashtiruv jarayonini mashg'ulotlarini o'tkazish to'g'risidagi fikrlar bayon qilingan.

Kalit so'zlar: Baxt-saodat, ijobiy fazilat, ideal inson, barkamol inson, g'urur hissi, aql –zakovat, yuksalish, kitobxonlik, yangicha tafakkur, yangi O'zbekistonda farovon yashash.

Kirish. Bugungi yoshlar nafaqat moddiy, avvalo, ma'naviy jihatdan erkin bo'lishi, do'stni dushmandan ajratishi, milliy g'oya bilan birga umumbashariy qadriyatlarini o'zida mujassamlashtirishi, shakllantirishi uchun ularning aql - zakovatini, tafakkurini, ma'naviyatini muntazam shakllantirib borish lozim. Ma'naviyat, odob-axloq, ibratli qadriyatlar, oliyjanob fazilatlar esa avvalo, oilada shakllanadi. Oila, farzand tarbiyasi, oilada ota-onaning o'rni xususida gap ketganda, o'zbek xalqining chinakam insoniy fazilatlarini o'zida ifoda etgan durdona asar «O'tkan kunlar» romani bosh qahramoni Yusufbek hojining: "Bu xonadondan hech kim norizo bo'lib ketgan emas" - degan gapida elimizga xos katta hayotiy falsafa mujassamligini teran anglaymiz. Ota-onaning farzand oldidagi burchlari, o'zlarining oxiratlarini obod etuvchi (yaxshi nom qo'yish, yaxshi muallimga topshirib savodini chiqarish, ilmi, kasb -xunarli qilish, oilali, uyli - joyli qilish kabi) qarzlari bor.

Ular o'z burchlarini ado etish bilan farzandlariga namuna ko'rsatadilar, shuningdek, barkamol avlodni tarbiyalash orqali jamiyatda munosib o'rin topish mumkinligini namoyon etadilar. Ushbu holat bir qarashda oddiy ko'rinadi, lekin hayotda o'chmas iz qoldirgan buyuk insonlar oddiy oilada kamtar insonlar qo'lida kamol topishini inobatga olsak, birinchi Prezidentimiz Islom Karimovning «Barkamol avlod orzusi», «Yuksak ma'naviyat-engilmas kuch» va «Ona yurtimiz baxtu iqbol va kelajagi yo'lida xizmat qilish - eng oliy saodatdir» kabi asarlarida oilaning jamiyatdagi o'rni beqiyos ekaniga bejiz to'xtalmaganliklariga ishonch hosil qilamiz.

Mavzuga oid adabiyotlar tahlili. Bugungi kunda oldimizga qo'ygan buyuk maqsadlarimizga, ezgu niyatlarimizga erishishimiz, jamiyatimizning yangilanishi, hayotimizning taraqqiyoti va istiqboli, amalga oshirilayotgan islohotlarimiz rejalarimizning samarasi, taqdiri barchasi zamon talablariga javob beradigan yuqori malakali, ongli mutaxassis kadrlar tayyorlash muammosi bilan chambarchas bog'liqligi barchamizga kundek ravshan. Zero, inson qalbiga yo'l, avvalo, ta'lim-tarbiyadan boshlanadi. Ta'lim-tarbiyaning to'g'ri yo'lga qo'yilishi, raqobatbardosh kadrlarni tayyorlash yurtning istiqbolini belgilab berishi jahon tajribasida o'z isbotini topgan.

Azaldan ota-bobolarimiz, komil ustozlarimiz ushbu usuldan ehtiyotkorona va mohirona foydalanganlar. Ular, shogird kamoli yo'lida ko'p yillik tajribadan kelib chiqib, tarbiyaviy vosita - bilimlar orqali tafakkur bulog'i bilan to'yintirilgan sharqona hayot maktabini yaratishgan.

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Barkamol inson – yangilanayotgan jamiyatimizni faqat iste'molchisigina emas, balki yaratuvchisi va fidoyisi ham bo'lishi kerak. Shuning uchun mustaqil davlatimizda ta'lim