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TO DEVELOP THE COMPETENCE TO USE A MATHEMATICAL APPARATUS BY SOLVING ECONOMIC ISSUES

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ABSTRACT

The use of mathematical programs to solve practical problems in the training of future specialists forms students' competence in using these programs and serves as the basis for the development of their knowledge. In this article, the methodology for using MathCAD programs to solve economic problems is shown using practical problems.

Keywords: Economics, income, cost, revenue, linear, nonlinear, MathCAD, product, demand.

INTRODUCTION

Digitalization of the economy, fundamental readiness of artificial intelligence professionals is functionally linked. The logical basis for fundamental preparation is that they are determined by their mathematical competence. So higher mathematics sciences need to improve the quality and effectiveness of the lesson. It is known that in the years that followed, the allocated cuts for higher mathematics classes were being reduced. Thus, the level of knowledge of the audience is diminished by their motivation to master science. This affects the effective conduct of the learning process. In our view, to improve the quality of the lesson, we give an example of the method of conducting the learning process based on the use of innovative and information technology in traditional learning, a great emphasis on discrete mathematics, and the use of information technology in practical lessons. (Matthew 24:14; 28:19, 20) Jehovah's Witnesses would be pleased to discuss these answers with you. The connection between these concepts can be linear, nonlinear. Therefore, a logical mathematical apparatus is used to check the function extreme of one and many variables in checking these links. We remind you that it is intended to show an analysis of the simplest practical issues[1,2]

Example1

Demand for a brand

$P = \dfrac{600}{x+20}$ is defined by the function. P- Commodity price, x- requirement amount.

It is necessary to ask the question of whether student demand changes are the volume of the goods, the commodity. You are required to comment on the reply.

We calculate the issue using the MathCAD program. [3]

Opt1

Talab $p(x) := \frac{600}{x+20}$

Revenue

$$U(x) := x \cdot p(x) - p(x) \text{ simplify } \rightarrow 600 - \frac{12600}{x+20}$$

$$U1(x) := \frac{d}{dx}U(x) \rightarrow \frac{12600}{(x+20)^2}$$

$$U1(x) > 0 \text{ solve } \rightarrow -20 < x \lor x < -20$$

$$U3(x) := \frac{d}{dx}U1(x) \rightarrow -\frac{25200}{(x+20)^3}$$

$$U3(x) < 0 \text{ solve } \rightarrow -20 < x$$

Therefore, revenue increases by increasing the demand for goods.

It is known that the consumer's financial assets will be chewed. It consumes goods to meet its needs. Here, how much to buy from each product is the main issue. [4]

Example 2. The consumer receives two different goods worth a financial amount of M sh.b. Their prices are P_1 and P_2 sh.b. soums, respectively. How much should you buy from each brand at a maximum?

We build a mathematical model to solve the problem, i.e.

$$\begin{cases} U(x_1,x_2) = 3x_1^{2/3}x_2^{1/3} \rightarrow extr(\max) \\ P_1x_1 + P_2x_2 \le u \\ x_1 \ge 0, x_2 \ge 0 \end{cases}$$

We will solve the issue in the MathCAD program.

1 $$U(x1,x2) := 3 \cdot x1^{\frac{2}{3}} \cdot x2^{\frac{1}{3}}$$

$$5 \cdot x1 + 10 \cdot x2 \le 100$$

$$x1 \ge 0 \qquad x2 \ge 0$$

We create a lagranj function.

$$L(x1,x2,\lambda) := U(x1,x2) + \lambda\cdot(100 - 5\cdot x1 - 10\cdot x2)$$

$$L1(x1,x2,\lambda) := \frac{d}{dx1}L(x1,x2,\lambda) \rightarrow \frac{2\cdot x2^{\frac{1}{3}}}{x1^{\frac{1}{3}}} - 5\cdot\lambda \qquad L2(x1,x2,\lambda) := \frac{d}{dx2}L(x1,x2,\lambda) \rightarrow \frac{x1^{\frac{2}{3}}}{x2^{\frac{2}{3}}} - 10\cdot\lambda$$

$$L3(x1,x2,\lambda) := \frac{d}{d\lambda}L(x1,x2,\lambda) \rightarrow 100 - 10\cdot x2 - 5\cdot x1$$

We find critical points.

$$x1 := 1 \qquad x2 := 1 \qquad \lambda := 1$$

Given

$$L1(x1,x2,\lambda) = 0$$

$$L2(x1,x2,\lambda) = 0$$

$$L3(x1,x2,\lambda) = 0$$

$$\begin{pmatrix} x10 \\ x20 \\ \lambda 0 \end{pmatrix} := Find(x1,x2,\lambda) \qquad \begin{pmatrix} x10 \\ x20 \\ \lambda 0 \end{pmatrix} = \begin{pmatrix} 13.333 \\ 3.333 \\ 0.252 \end{pmatrix}$$

Demak

$$U(x10,x20) = 25.198$$

Based on these, the following conclusions; we'll have a bee. The total price for the purchase of goods is 25198sh.b.

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