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# METHOD OF SOLUTION OF A PROBLEM ON THE SUBJECT OF DEFINITE INTEGRAL APPLICATIONS

***Muhammad Akramov***
*Teacher of the 13th school of Shofirkon district, Bukhara region*
*E-mail: muhammad.akramov1293@mail.ru*
***Nafisa Ahadova***
*Teacher of the 13th school of Shofirkon district, Bukhara region*
*E-mail: nafisaahadova5@gmail.com*

**Abstract:** This article discusses the methods of solving problematic issues in teaching the topic "Applications of the definite integral" in mathematics in secondary schools. The steps and advantages of these methods are analyzed.

**Keywords:** derivative of a function, integral of a function, graph of a function, face of a form.

We know well that mathematics develops students' will, the ability to concentrate and activity, imagination, moral qualities of a person and the ability to defend their views and beliefs on the basis of evidence. The object of studying mathematics consists of the spatial forms of things in matter and the quantitative relationships between them. Observations show that some teachers and students have problems solving problems related to the application of the Definite Integral. In this article, we present a solution to the problem of applications of the definite integral.

Matter. $y = 2x^2 - 8x$, parabola and find the surface of the figure bounded by the axis of the parabola and its axis $oy$?

Solving. We will solve this problem sequentially.

1. we determine the coordinates of the tip of the parabola $y = 2x^2 - 8x$, that is $(x_0; y_0)$, we find using $x_0 = \frac{-b}{2a}$ $y_0 = f(x_0)$, we get $x_0 = 2$ $y_0 = -8$.
2. Let's write the equation of the force passed through the parabola. For this, we use the test equation transferred to the function, i.e $y = f(x_0) + f'(x_0)(x - x_0)$. For this we need the derivative of the given function. According to the definition of the derivative $f'(x) = 4x - 8$, we can find $f'(x_0)$, it is $f'(2) = 0$. So the equation of effort is as follows $y = -8$.
3. We describe the given parabola and the trial made to it on the plane of Cartesian coordinates and mark the area bounded by the parabola, trial and moon axis.

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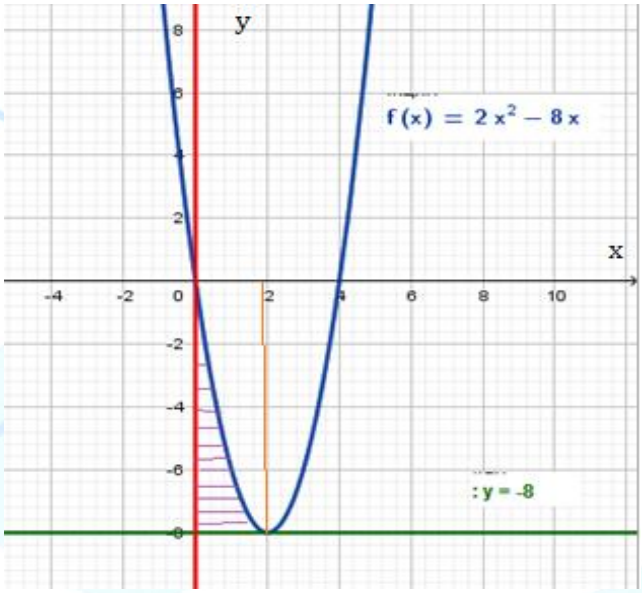
It is necessary to calculate the area of the specified area according to the condition of the problem.




4. We calculate the surface of the specified area using the rule for calculating surfaces using integrals.

$$\int_0^2 (2x^2 - 8x - (-8))dx = \int_0^2 (2x^2 - 8x + 8)dx = \left(\frac{2x^3}{3} - 4x^2 + 8x\right)\Big|_0^2 = \frac{16}{3} - 16 + 16 - 0 = \frac{16}{3}$$

Using the solution of this problem, the student can independently complete the rest of the problems in the textbook.

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