"FUNKSIYA XOSILASI" MAVZUSINI ALGORITM YORDAMIDA O'RGANISH

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Tabiiy va aniq fanlarga ixtisoslashtirilgan S.H.Sirojiddinov nomidagi Respublika akademik litseyi Matematika kafedrasi o'qituvchisi

Annotatsiya: Ushbu maqolada litsey talabalari uchun hosila mavzusi chuqurroq o'rgatilgan. Ko'p holatlarda talabalarda hosila olishda qilinadigan ishlari ketma-ketligida adashishlar kuzatilayapti. Shu kamchiliklarni bartaraf etishda bu maqola katta yordam beradi.

Kalit so'zlar: Klaster metodi, xosila, foydalanish, usullar, matematika, o'qitish, funksiya.

Аннотация: В этой статье Более подробно рассказывается о производной теме для старшеклассников. Во многих случаях учащиеся ошибаются в последовательности действий, которые они выполняют при получении производных. Эта статья очень поможет в устранении этих недостатков.

Ключевые слова: Кластерный метод, производная, использование, методы, математика, обучение, функция.

Annotation: This article explains in more detail about the derived topic for high school students. In many cases, students make mistakes in the sequence of actions they perform when obtaining derivatives. This article will greatly help in eliminating these shortcomings.

Key words: Cluster method, derivative, use, methods, mathematics, learning, function.

Zamonaviy ta'limda klaster metodlarini qo'llash ta'lim sifat va samaradorligiga ijobiy ta'sir o'tkazadi. Jumladan matematika fanlarini o'qitish metodikasida uning bazaviy bo'limlarining klaster modellarini ishlab chiqish va undan o'quv jarayonlarida foydalanish Oliy ta'limdagi dolzarb masalalardan biri xisoblanadi. Funksiyaning nuqtadagi xosilasi.$y = f(x)$ funksiya (a, b) intervalda aniqlangan bo'lsin. (a, b) intervalga tegishli x_0 va $x_0 + \Delta x$ nuqtalarni olamiz.

$y = f(x)$ funksiyaning bu nuqtalardagi qiymatlari $f(x_0)$ va $f(x_0 + \Delta x)$ dan funksiyaning $\Delta y = f(x_0 + \Delta x) - f(x_0)$ orttirmasini tuzamiz. y argument Δx ga o'zgarganda funksiya qanchaga o'zgarishini ko'rsatadi.

$\frac{\Delta y}{\Delta x}$ nisbatni qaraymiz uni argument Δx ga o'zgarganida funktsiyaning o'rtacha o'zgarishi deb ataladi.

1-ta'rif. Funksiya orttirmasi Δy ning argument orttirmasi Δx ga nisbatining Δx nolga intilgandagi limiti $y = f(x)$ funksiyaning x_0 nuqtadagi xosilasi deb ataladi.

Bu limit ushbu belgilardan biri bilan belgilanadi

y', $f'(x_0)$, $\dfrac{dy}{dx}$, $\dfrac{df}{dx}$

shunday qilib

$f'(x_0) = \lim\limits_{\Delta x \to 0} \dfrac{dy}{dx} = \lim \dfrac{f(x0+\Delta x)-f(x0)}{\Delta x}$.

Agar bu limit mavjud bo'lsa, xosila x_0 nuqtada mavjud deb ataladi.

Endi hosila ta'rifidan foydalanib, $y = f(x)$ funksiya xosilasini topishning quyidagi algoritmini berish mumkin:

$1^0.$ Argumentning tayinlangan x qiymatiga mos funktsiyaning qiymati $f(x)$ ni topish.

$2^0.$ Argument x ga $f(x)$ funksiyaning aniqlanish sohasidan chiqib ketmaydigan $\triangle x$ orttirma berib $f(x + \triangle x)$ ni topish.

$3^0.$ Funksiyaning $\triangle f(x) = f(x + \triangle x) - f(x)$ orttirmasini hisoblash.

$4^0.$ $\dfrac{\Delta f(x)}{\Delta x}$ nisbatni tuzish.

$5^0.$ $\dfrac{\Delta f(x)}{\Delta x}$ nisbatning $\triangle x \to 0$ dagi limitini hisoblash.

1-misol. $y = kx + b$ funksiyaning hosilasini toping.
Yechish. Xosila topish algoritmidan foydalanamiz.

$1^0.$ Argument x ni tayinlab, funksiya qiymatini hisoblaymiz: $f(x) = kx + b$.
$2^0.$ Argumentga $\triangle x$ orttirma beramiz, u holda
$f(x + \triangle x) = k(x + \triangle x) + b = kx + k \triangle x + b$
$3^0.$ Funksiya orttirmasi
$\triangle f(x) = f(x + \triangle x) - f(x) = (kx + k \triangle x + b) - (kx + b) = k \triangle x$

$4^0.$ $\dfrac{\Delta f(x)}{\Delta x} = \dfrac{k\Delta x}{\Delta x} = k$.

$5^0.$ $\lim\limits_{\Delta x \to 0} \dfrac{\Delta f(x)}{\Delta x} = \lim\limits_{\Delta x \to 0} k = k$. Demak, $(kx + b)' = k$ ekan.

2-misol. $y = \sqrt{x}$ $(x > 0)$ funksiyaning $\forall x \in (0; +\infty)$ nuqtadagi xosilasini toping.
Yechish. Xosila topish algoritmidan foydalanamiz.

$1^0.$ Argument x ni tayinlab, funksiya qiymatini hisoblaymiz:
$$f(x) = \sqrt{x}$$
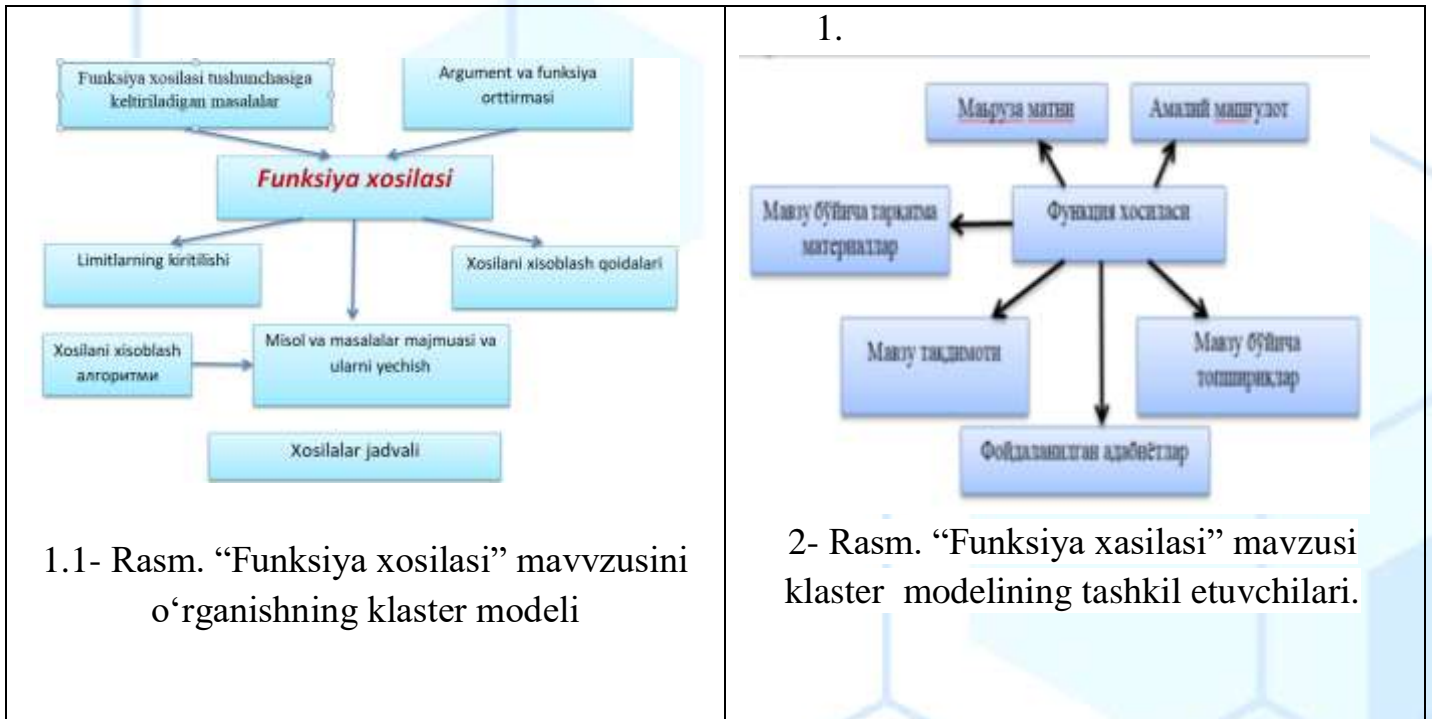$2^0.$ Argumentga $\triangle x$ orttirma beramiz, u holda

$$f(x + \Delta x) = \sqrt{x + \Delta x}$$

3⁰. Funksiya orttirmasi

$$\Delta f(x) = f(x + \Delta x) - f(x) = \sqrt{x + \Delta x} - \sqrt{x}$$

4⁰. $\frac{\Delta f(x)}{\Delta x} = \frac{\sqrt{x+\Delta x}-\sqrt{x}}{\Delta x} = \frac{1}{\sqrt{x+\Delta x}+\sqrt{x}}$

5⁰. $\lim\limits_{\Delta x \to 0} \frac{\Delta f(x)}{\Delta x} = \lim\limits_{\Delta x \to 0} \frac{1}{\sqrt{x+\Delta x}+\sqrt{x}} = \frac{1}{2\sqrt{x}}$ Demak, $(\sqrt{x})' = \frac{1}{2\sqrt{x}}$ ekan

1.1- Rasm. "Funksiya xosilasi" mavvzusini o'rganishning klaster modeli

2- Rasm. "Funksiya xasilasi" mavzusi klaster modelining tashkil etuvchilari.

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