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FUNKSIYA HOSILASI

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Annotatsiya: Hosila — differensial hisobning asosiy tushunchasi. U funksiya o'zgarishi tezligini ifodalaydi. x_0 nuqtaning atrofida berilgan f(x) nuqta uchun mavjud bo'lsa, u funksiyaning x_0 nuqtadagi hosilasi deyiladi Va $f'(x_0)$ kabi belgilanadi.

Abstract: The derivative is a basic concept of differential calculus. It represents the rate of change of the function. If f(x) exists for a given point around the point x_0, it is called the derivative of the function at the point x_0 and is denoted as $f'(x_0)$

Аннотация: Производная является основным понятием дифференциального исчисления. Он представляет собой скорость изменения функции. Если f(x) существует для данной точки вокруг точки x0, то она называется производной функции в точке x0 и обозначается как f'(x0).

Funksiyaning hosilasi matematikda aniq nuqtalarga kelgan funksiyaning qanchalik tez o'zgarishining hisoblanishi va bu tezlikning aniq nuqtaga yaqinlashgan holda nechi o'zgarishiga mos kelishi bilan bog'liq fan tushunchalari va metodlari.

Funskiyaning hosilasi tarifi.

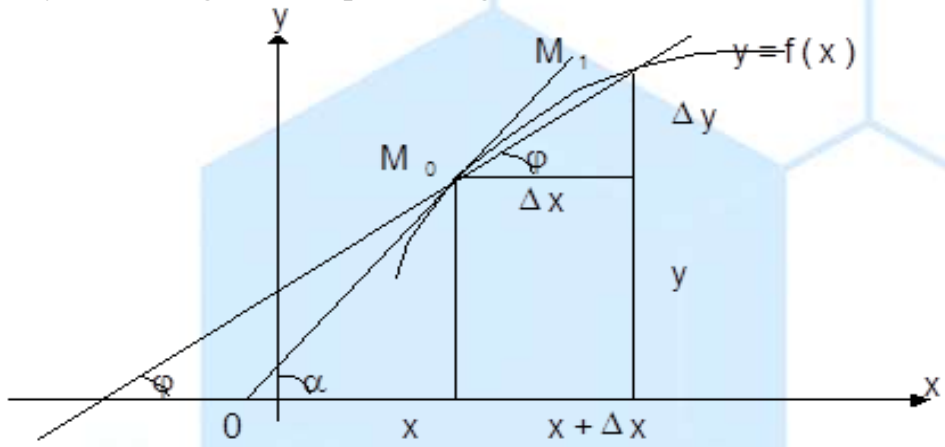
Ta'rif: Agar

$$f'(x_0)=\lim_{\Delta x\to 0}\frac{\Delta y}{\Delta x}=\lim_{\Delta x\to 0}\frac{f(x_0+\Delta x)-f(x_0)}{\Delta x}$$

Limit mavjud bulsa bu limit y=f(x) funksiyaning x_0 nuqtadagi hosilasi deyiladi..

Hosilaning geometrik manosi.

y=f(x) funksiya grafigining absissasi x_0 bulgan nuqtasi orqali funksiya grafigiga urinma qilib y=kx+b tug'ri chiziq o'tkazilgan bulsin



F(x) funksiya hosilasining x_0 nuqtadagi qiymati f(x) funksiya grafigiga x_0 nuqtada o'tkazilgan urinmaning burchak koefsentiga teng buladi. Yani

f '(x)=k tenglik o'rinli buladi.

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$$\lim_{\Delta x \to 0} \left(\frac{f(x+\Delta) - f(x)}{\Delta x} \right) = \text{tg}\,\alpha = k$$

(Hosila olishning) Differensiallashning asosiy formulalari

$y' = 0$ $\qquad$ $y = x^{\alpha};\quad y = \alpha x^{\alpha-1}$

$y = \sqrt{x};\ y' = \frac{1}{2\sqrt{x}}$ $\qquad$ $y = \frac{1}{x};\quad y = -\frac{1}{x^2}$

$y = a^x;\ y' = a^x \ln a$ $\qquad$ $y = e^x;\ y' = e^x$

$y = \log_a x;\quad y' = \frac{1}{x}\log_a e$ $\qquad$ $y = \ln x;\quad y' = \frac{1}{x}$

$y = \sin x;\quad y' = \cos x$ $\qquad$ $y = \cos x;\quad y' = -\sin x$

$y = tgx;\quad y' = \frac{1}{\cos^2 x}$ $\qquad$ $y = ctgx;\quad y' = -\frac{1}{\sin^2 x}$

1.Ikkita differensiallanuvchi funksiyalar ko`paytmasining hosilasi birinchi funksiya hosilasining ikkinchi funksiya bilan ko`paytmasi hamda birinchi funksiyaning ikkinchi funksiya hosilasi bilan ko`paytmasining yig`indisiga teng:

$$y' = u'\vartheta + u\vartheta'$$

2.Ikkita differensiallanuvchi funksiyalar bo`linmasining hosilasi (kasrda ifodalanib) bo`linuvchi funksiya hosilasini bo`luvchi funksiya bilan ko`paytmasi hamda bo`linuvchi funksiyani bo`luvchi funksiya hosilasi bilan ko`paytmasining ayirmasini bo`luvchi (maxrajdagi) funksiya kvadratining nisbatiga teng:

$$y = \frac{u}{\vartheta} \Longrightarrow y' = \frac{u'\vartheta - u\vartheta'}{\vartheta^2}$$

Foydalanilgan adabiyotlar:

http://reja.tdpu.uz/shaxsiyreja/content/4455/html/53787/7.%20ma'ruza.%20Funksiya%20hosilasi..htm

https://staff.tiiame.uz/storage/users/187/presentations/wpK4T4LipGrhd9jeTjU1OUHjE6KKqob90YmApEsZ.pdf

https://staff.tiiame.uz/storage/users/184/presentations/bwaNCi4PzrQpJcxClgN03iy7Cfscz6lhIPk7VqiG.pdf