

MATHEMATICAL MODELING IN VIRTUAL REALITY

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Annotatsiya: Ushbu maqolada siz matematik modellashtirishning virtual borliqda namoyon bo'lishiga guvoh bo'lasiz va matematik modellashtirish, virtual borliq haqidagi tushunchalaringizni yanada kengaytirish imkoniyatiga ega bo'lasiz. Matematik modellashtirishning virtual borliqda namoyon bo'lishlari, online tarzda, VR gadjetlarisiz modellar bilan ishlay olish imkoniyatlari haqida tanishasiz.

Keywords: Mathematical model, virtual reality, gadget, comfort, discomfort, GeoGebra, geometry, algebra, 3D, MathCAD, MatLAB, graphics, function, Google, Chrome, Yandex, Bowser.

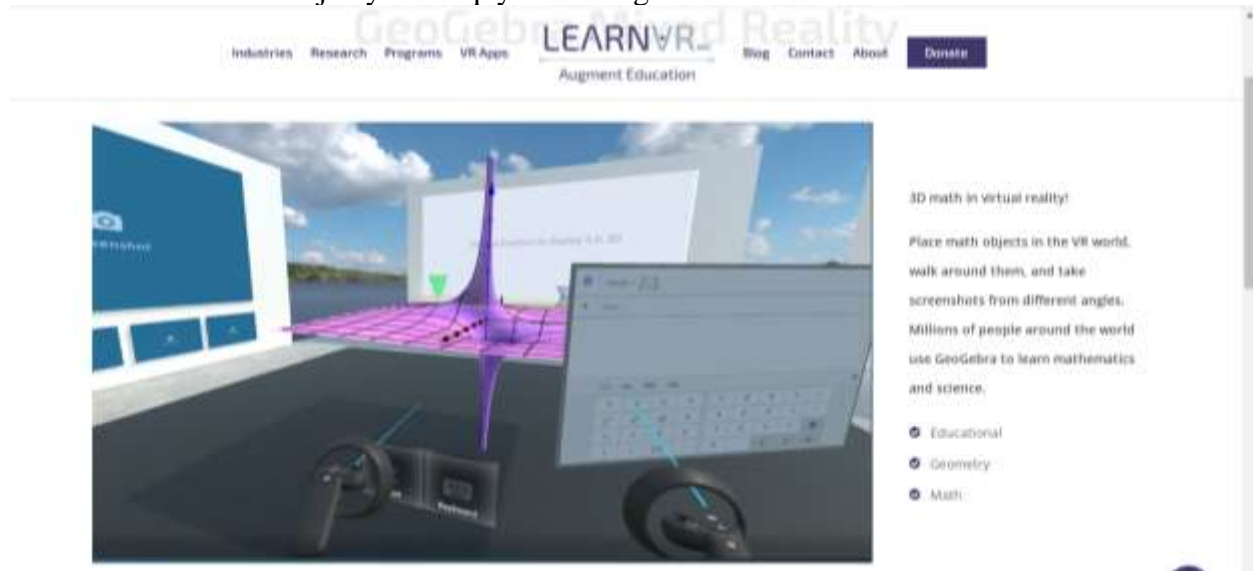
Kirish. Butun borliq - matematik modeldir. Eng kichik jismdan tortib, eng buyuk kashfiyotlarning asosi matematika bilan bog'liq, negaki, ularning modelini yaratishda aniq hisob-kitoblarga tayaniladi, bu esa matematikaga borib taqaladi. Virtual borliq - jonli borliqning sun'iy, uch o'lchamli va yoki boshqa hislatlarni o'zida jam qilgan modelidir. Virtual borliqda foydalaniladigan texnika gadjetlarining barchasi inson uchun komfort bo'la oladigan jismlarning shakl-shamoyili asosida modellangan va ishlab chiqilgan.

Biz shu vaqtga qadar matematik modellashtirish jarayonlarini bir o'lcham yoki ikki o'lchamda ko'rib, o'rganib keldik. Ammo, tasavvur qiling, virtual borliq yordamida rangli, uch o'lchamli (3D), asosiysi u modelimiz uzra o'zimiz harakatlana olamiz. Atrofimizdagi bo'shliqliklardan foydalangan xolda virtual borliqni yaratdik, undan foydalanish esa zamon talabiga aylandi, chunki eski o'rganish tizimlari insonlarni zeriktira boshladi. Misol tariqasida, shu paytgacha matematik modellashtirishni o'rganishda foydalanilgan dasturlardan ikkitasini sanab o'tsam, ular MathCAD va MatLAB. MathCAD model yaratish uchun eng sodda dastur deb tan olingan va albatta dasturlar foydalanuvchilarga qulaylik yaratishi shart. Ammo, unda yaratilgan modellar keng ko'lamli emas edi, uch o'lchamda yaratish mumkin bo'lgan modellarni harakatlantirish, o'zimiz xohlagan qismidan turib uni o'rganish imkoniyati yo'q yoki juda past edi. MatLAB esa nokomfortligi bilan qolgan dasturlardan ajralib turadi, ammo murakkab jarayonlarga boy dastur ham. Undagi modellar hozirgi zamonda yaratilib kelinayotgan modellar bilan raqobatbardosh emaslar. Buning sababi esa oddiy, hozirgi zamonning model yaratish dasturlarning asosi hozirgacha rivoj topib keldi.

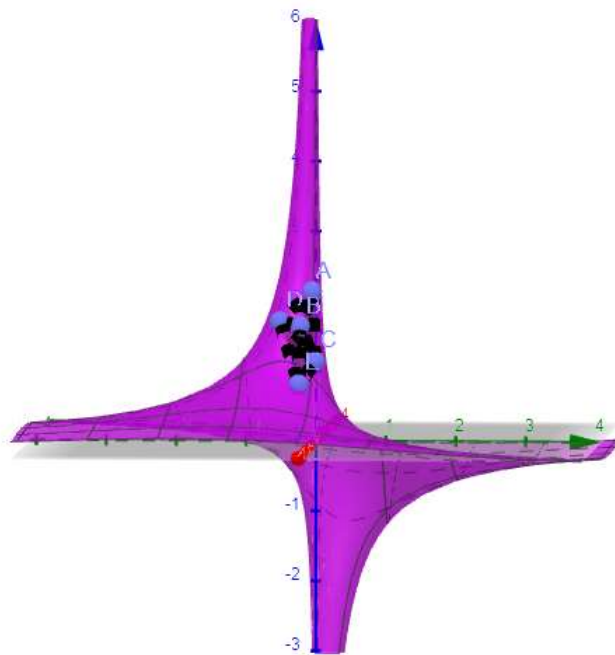
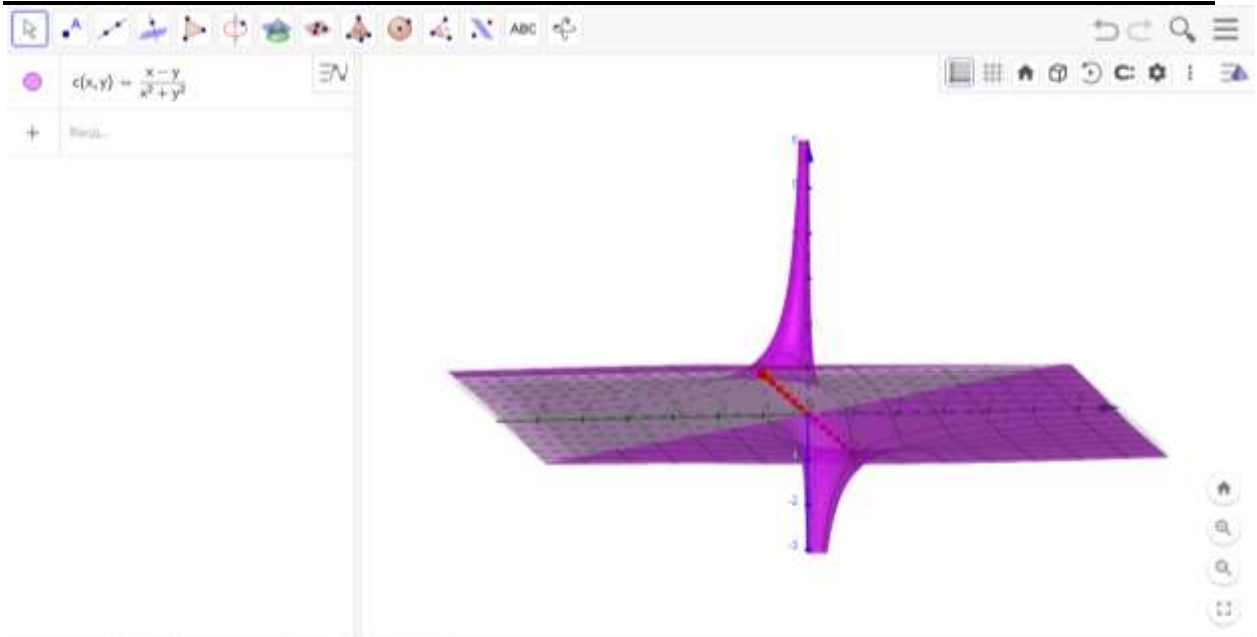
Asosiy qism. Virtual borliqni o'rganish tashkiloti tomonidan ishlab chiqilgan GeoGebra dastur-ilova asosida o'rganuvchilar matematika yordamida tuzilgan modellarni ko'z o'ngilarida ko'rish va xatto uni qo'llari yordamida harakatlantirish imkoniyatiga ega bo'ladilar. Dunyo bo'ylab millionlab insonlar GeoGebra yordamida matematika va ilm-fan asoslarini o'rganadilar. Ta'lim, geometriya va algebra(matematika) – bu uch qism GeoGebra ta'lim ilova-tizimining asosidir. Biz bu ilova-dastur ko'magi bilan algebra, matematikada tuzgan grafiklarimiz yoki chizmalarimizni eng kichik ko'rib bo'lmas va ilg'ab bo'lmas nuqtalarini ko'ra olamiz. Eng asosiysi xatoliklar darajasi kamayadi.

Bu dasturning telefon qurilmalari uchun ham ilovalari mavjud. Shunchaki, qurilmangizdagi ilova yuklovchi qismiga “GeoGebra” nomini yozsangiz kifoya.

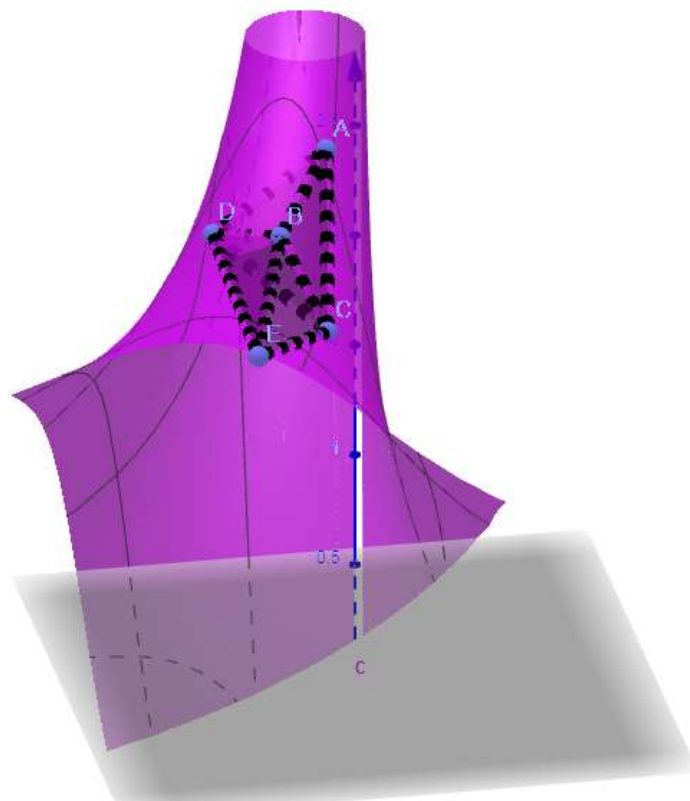
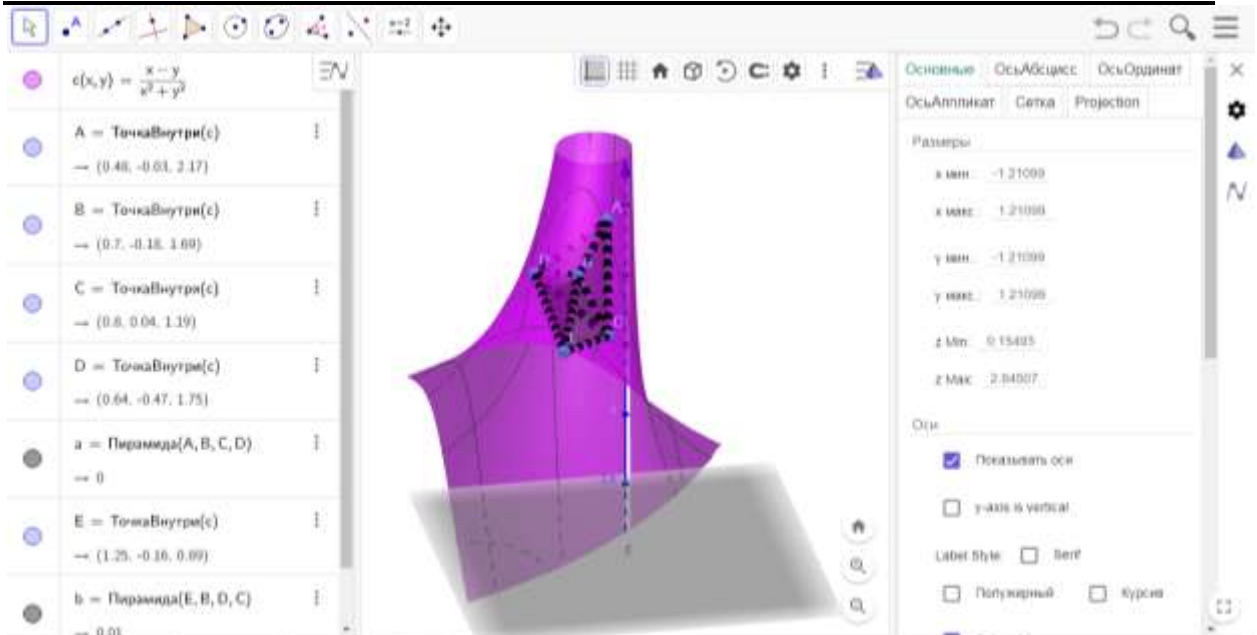
GeoGebra bilan ishlash jarayonlari quyida aks etgan.



1-rasm. Yuqorida GeoGebra dasturida ishlash jarayoni aks etgan. Unda funksiya kalkulyator bo'limiga kiritiladi va dastur funksiya grafigini ko'z oldingizda 3D ko'rinishida namoyon qiladi. Siz u grafikni qo'lga moslangan gadjetlar yoki qurilmangiz sensori yordamida harakatlantirish, 3D ko'zoynaklari yoki o'z ko'zingiz bilan ham ko'rishingiz mumkin. Screenshot bo'limi yordamida grafikni istalgan qismidan sur'at olishingiz mumkin. Eng qiziqarli qismi esa, agar, siz to'liq gadjetlarga ega bo'lsangiz u grafik uzra sayohatga chiqa olishingizdir.



2-rasm. Yuqoridagi rasmda o'zimizning brovzer (Google, Chrome, Yandex, Bauzer va hkz.) yordamida onlayn GeoGebra ilovasini qo'lladik. Misol tariqasida: $c(x,y)=\frac{x-y}{x^2+y^2}$ funksiya grafigini 3D shaklida hosil qildik. Ko'rib tuganingizdek, biz grafik modelni dastur yordamida yaqinlashtirish, uzoqlashtirish, biron qismidan qirqib olish, oson harakatlantirish, istalgan tomonimizdan ko'rish va yana boshqa ko'p imkoniyatlarga ega bo'lamiz.



3-rasm. Bu yerda esa, 1- va 2- rasmdagi grafikning yaqinlashtirilgan ko'rinishi ustida bir necha nuqtalar bilan ishlash jarayoni aks etgan. U nuqtalar(A,B,C,D,E) bir biriga kesishtirilgan va piramida hosil qilingan.

Xulosa va takliflar. Guvohi bo'lganingizdek, yaratilgan matematik modellarni virtual borliqda namoyon qilish zamonning muammolaridan biri emas. Yuqoridagi dastur-illovasidek yana ko'plab shunday ilovalar mavjud va shungga o'xshash dasturlarni tuzish barchamizning

qo'limizdan keladi. Eng asosiysi hayotimizdagi modellarni real hayotga va virtual hayotga tadbiiq eta olishimiz.

Virtual borliqning afzalliklari doimo insonlar hayotiga foyda keltirgan, ammo uning ziyon tomonlari ham mavjud, inson salomatligiga virtual borliqda qo'llanilgan gadjetlar sezilarni ziyon yetkazishlari mumkin. Avvalo, ziyondan saqlanish, afzalliklardan foydalanish zarur.

Maqola matematik modellashtirishning virtual borliqda namoyon qilish imkoniyatlari to'g'risida edi.

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