



INNOVATIVE
WORLD

$$\left(\frac{T_1}{T_2}\right)^2 = \left(\frac{a_1}{a_2}\right)^3$$



TADQIQOTLAR



ILM-FAN



TEKNOLOGIYALAR

ZAMONAVIY ILM-FAN VA INNOVATSIYALAR NAZARIYASI

ILMIY-AMALIY KONFERENSIYA

2025



Google Scholar



zenodo



Andijan, Uzbekistan



+998945668868



<https://innoworld.net>

INNOVATIVE
WORLD

« ZAMONAVIY ILM-FAN VA INNOVATSIYALAR
NAZARIYASI » NOMLI ILMIY, MASOFAVIY, ONLAYN
KONFERENSIYASI TO'PLAMI

2-JILD 2-SON

Konferensiya to'plami va tezislari quyidagi xalqaro
ilmiy bazalarda indexlanadi

Google Scholar



ResearchGate

zenodo



ADVANCED SCIENCE INDEX



Directory of Research Journals Indexing

www.innoworld.net

O'ZBEKISTON-2025

Parametrli kvadrat tenglamalar

X. L. Gaipova

“University of Economics and Pedagogy”, NOTM
boshlang’ich ta’lim yo’nalishi III bosqich talabasi.

A.G. Abdullayev

“University of Economics and Pedagogy”, NOTM
“Maktabgacha va boshlang’ich ta’lim” kafedrası dosenti.

Ma’lumki oily ma’lumotli muhandis yoki iqtisodchi ishlab chiqarish bilan bog’liq turli modellarni tahlil qila olishi lozim bo’ladi. Odatda bunday modellar tenglama va tengsizliklardan tashkil topib, ularda noma’lum parametrlar ham qatnashadi. Bu noma’lum parametrlarning turli qiymatlarida o’rganilayotgan model hossalarni to’g’ri talqin qilishni bilish uchun avvalo maktab dasturi doirasida parametrlarga bog’liq tenglama va tengsizliklarni yahshi tahlil qila olish zarur deb hisoblaymiz.

Ushbu risolada parametrlarga bog’liq kvadrat tenglamalarni tahlil qilish bo’yicha ba’zi mulohazalarimizni keltirdik.

T e o r e m a. $ax^2 + bx + c = 0$, ($a \neq 0$) kvadrat tenglama ildizlari va koeffitsiyentlari orasida quyidagi munosabatlar o’rinlidir:

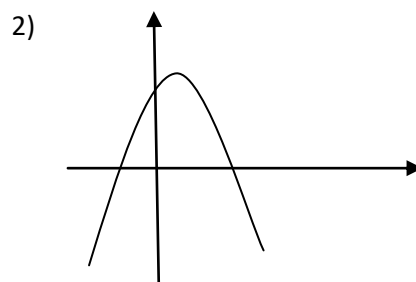
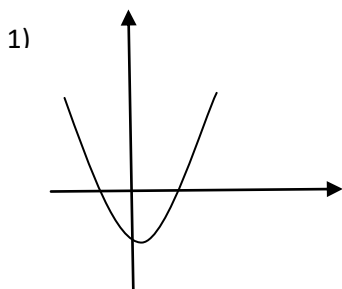
- A) $ac < 0$ bo’lganda tenglama ikkita turli ishorali ildizlarga ega;
- B) $ac < 0$ va $b = 0$ bo’lganda tenglama ildizlari qarama -qarshi sonlardan iborat;
- C) $ac > 0, D = b^2 - 4ac > 0$ bo’lganda tenglama ikkita bir hil ishorali ildizlarga ega va bu ishora " ab " ishorasiga qarama-qarshi bo’ladi;
- D) $D = 0$ bo’lganda tenglama bitta $x_0 = -\frac{b}{2a}$ ga teng ildizga ega;
- E) $D < 0$ bo’lganda tenglama ildizlari mavjud emas.

Bu teorema isboti bizga yahshi ma’lum bo’lgan kvadrat tenglama ildizlarini topishning quyidagi formulasini

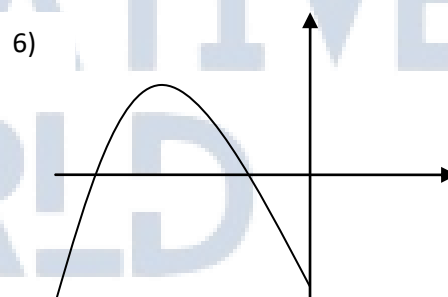
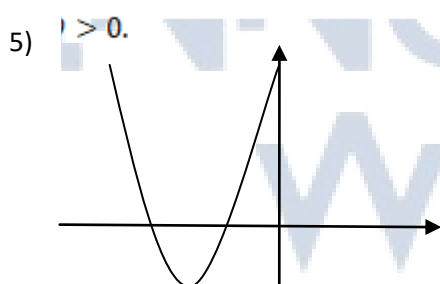
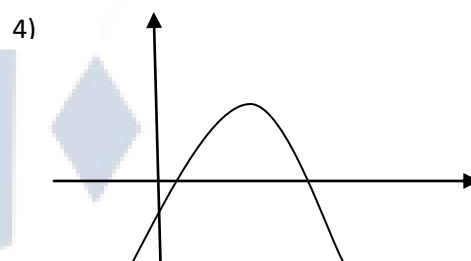
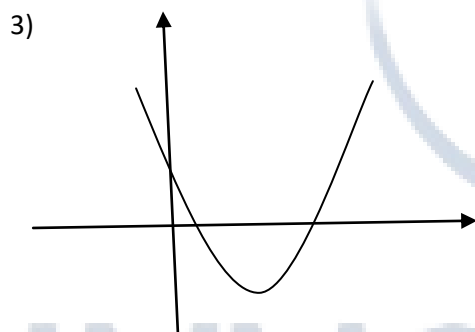
$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad (1)$$

tahlil qilishdan kelib chiqadi. Haqiqatan ham agar $ac < 0$ bo’lsa, u holda $\sqrt{b^2 - 4ac} > |b|$ bo’lib, (1) tenglik bilan aniqlanadigan ildizlarning biri musbat bo’lsa, ikkinchisi manfiy bo’ladi.

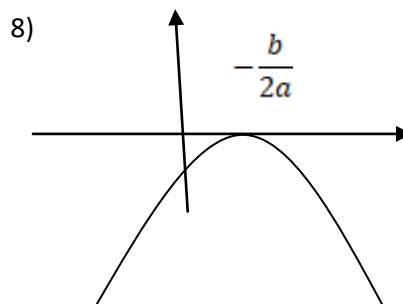
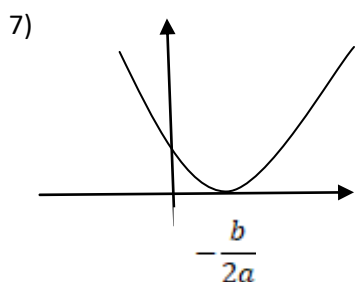
Bu shartlarda $y = ax^2 + bx + c$, ($a \neq 0$) kvadrat funksiya grafigi quyidagi ikki holdan biri ko’rinishida bo’ladi:



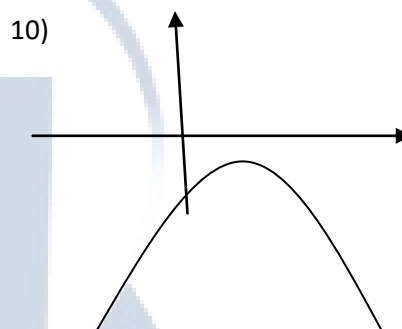
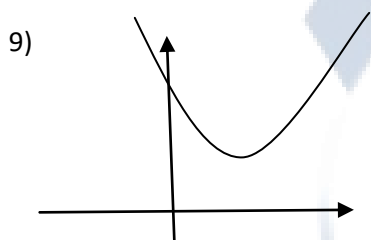
Agar $ac > 0, D > 0$ bo'lsa, u holda $\sqrt{b^2 - 4ac} < |b|$ bo'lib, (1) tenglik bilan ildizlarning har ikkiisi ham " $-ab$ " ishorasi bilan bir hil ishorali bo'ladi. Ushbu shartlarda $y = ax^2 + bx + c$, ($a \neq 0$) kvadrat funksiya grafigi quyidagi hollardan biri ko'rinishida bo'ladi:



$D = 0$ bo'lganda tenglama bitta (ikkita bir hil) $x_0 = -\frac{b}{2a}$ ga teng ildizga ega, taabiyki bu holda funksiya grafigi quyidagilardan biri ko'rinishida bo'ladi:



$D < 0$ bo'lganda tenglama ildizga ega emas. Bu holda kvadrat funksiya grafigi quyidagilardan biri ko'rinishida bo'ladi:



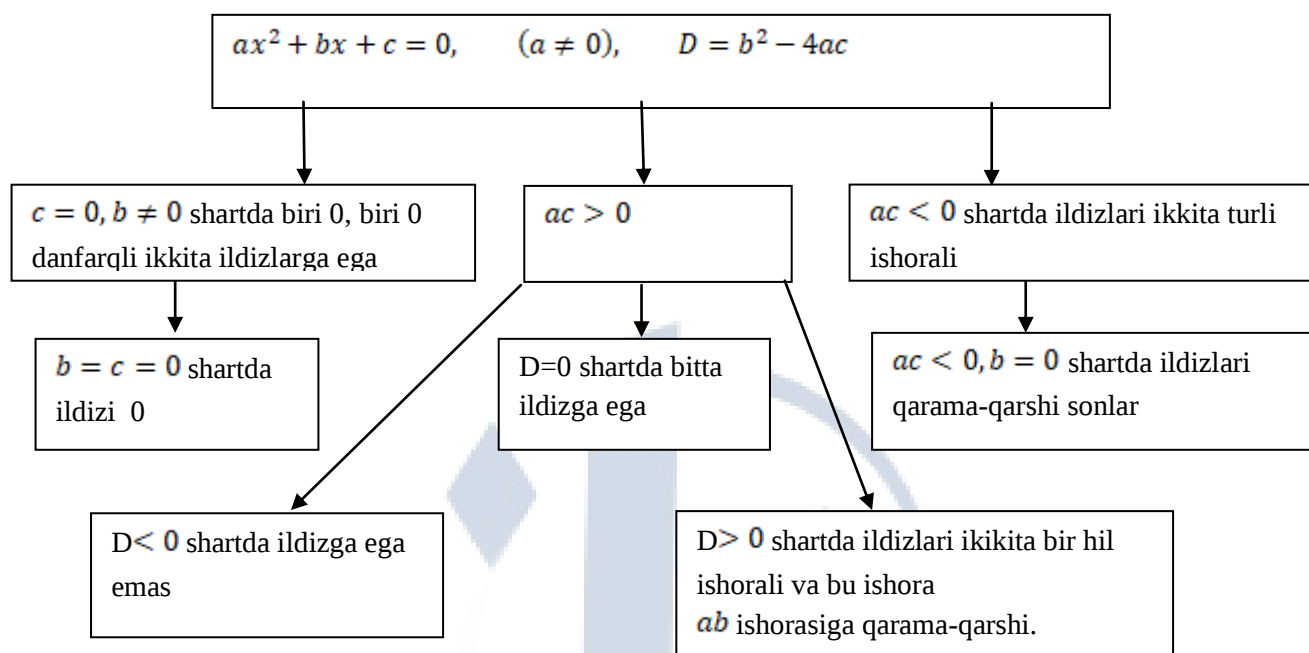
Misol-1. a parametrning qanday qiymatlarida $ax^2 - 2(a+1)x + a - 3 = 0$ tenglama ikkita manfiy ildizlarga ega.

Yechish: Teoremaning **C)** bandiga ko'ra quyidagi shartlar sistemasi bajarilishi lozim:

$$\begin{cases} 4(a+1)^2 - 4a(a-3) > 0 \\ a(a-3) > 0 \\ -a(a+1) > 0 \end{cases}$$

Bu tengsizliklar sistemasini birgalikda yechib, $a \in (-\frac{1}{5}; 0)$ javobni olamiz.

Kvadrat tenglama ildizlari va koeffitsiyentlari orasidagi munosabatlarni quyidagicha sxematik tasvirlash ham mumkin:



Adabiyotlar

1. Sh. Sh. Shohamidov. Amaliy matematika unsurlari. Toshkent, Fan, 2004 y.
2. M. Usmanov. Matematika. Tashkent, 2015 y.
3. M. I. Skanaviy. Matematikadan masalalar to'plami, Toshkent, 2018 y.