ISSN 2181-3187

YO'L BO'YICHA ANALITIK DAVOM ETTIRISH USULLARI

Kalbaev S.N.

Ajiniyoz nomidagi NDPI, stajer tadqiqotchisi

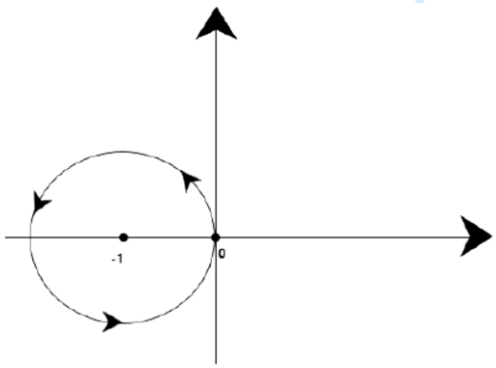
Kalit so'zlar: qirqilgan, tarmoq, akslantirish.

Ключевые слова: разрезам, ветвь, отображение.

Key words: cuts, branch, mapping.

Analitik davom ettirish bizga funksiyalarni tadbiq qilishda kengnan yordam beradi. Ayrim funksiyalarning analitik yoyilmalarini qaraymiz.

Misol. $f_0(z)=\frac{1}{i}\ln i\left(z+\sqrt{z^2-1}\right)$ boshlang'ich elementi $f_0(0)=0$ bo'lgan 1-rasmda tasvirlangan yo'l bo'ylab $f(z)$ funksiyaning analitik davomi $f_\gamma(z)$ni toping.

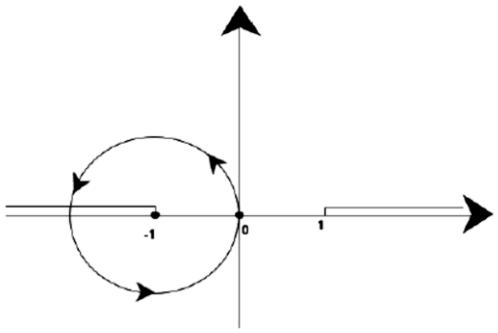


(1-rasm)

Yechimi: $\frac{1}{i}\ln i\cdot\sqrt{-1}=0$ $\qquad\sqrt{-1}=-i$

Yo'lni soddalashtiramiz va uni akslantiramiz (2-rasm)

ISSN 2181-3187



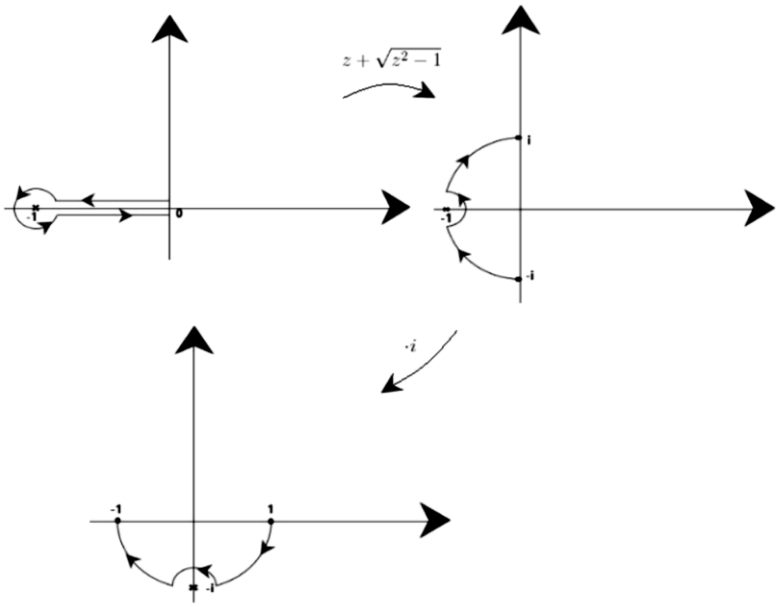
(2-rasm)

$$\ln 1 = 0, \quad \ln -1 = -\pi i$$

$$f_\gamma(0) = \pm f_0(0) - \pi$$

Endi f_0 ning oldidagi ishorasini aniqlashimiz kerak.

$z + \sqrt{z^2 - 1}$ funksiya, Jukoviskiy funksiyasiga teskari funksiya. 3-rasmda ko'rsatilgan qirqilgan oblastni qaraymiz.



(3-rasm)

Jukoviskiy funksiyasiga teskari bo'lgan funksiya, berilgan sohani yoki yo'qori yoki pastki yarim tekislikga akslantiradi, biz pastdan yo'qoriga o'tamiz, ya'niy

ISSN 2181-3187

tarmoqlarini almashtiramiz. Ikki tarmoq bir biridan $\frac{1}{z}$ boshlang'ish bilan fariqlanadi, unda logarifmning oldida minus belgi hosil bo'ladi $f(z)=\frac{1}{i^n}\ln(i\text{Ж}_{1,2}^{-1}(z))$

$$f_0(z)=\frac{1}{i^0}\ln(i\text{Ж}_2^{-1}(z))$$

$$f_\gamma(z)=\frac{1}{i^{-1}}\ln(i\text{Ж}_1^{-1}(z))$$

$$\text{Ж}_1^{-1}=\frac{1}{\text{Ж}_2^{-1}}$$

$$f_\gamma(z)=\frac{1}{i^{-1}}\ln(i\frac{1}{\text{Ж}_2^{-1}(z)})=-\frac{1}{i^0}\ln(i\text{Ж}_2^{-1}(z))-\pi$$

Bundan $f_\gamma(z)=-f_0(z)-\pi$

Javob. $f_\gamma(z)=-f_0(z)-\pi$

Adabiyotlar

1.Ю.В. Сидоров, М.В. Федорюк, М.И. Шабунин. Лекции по теории функций комплексного переменного. -М.: Наука, 1982, 1989.

2. М.А. Евграфов. Аналитические функции.- М.: Наука, 1965, 1968.