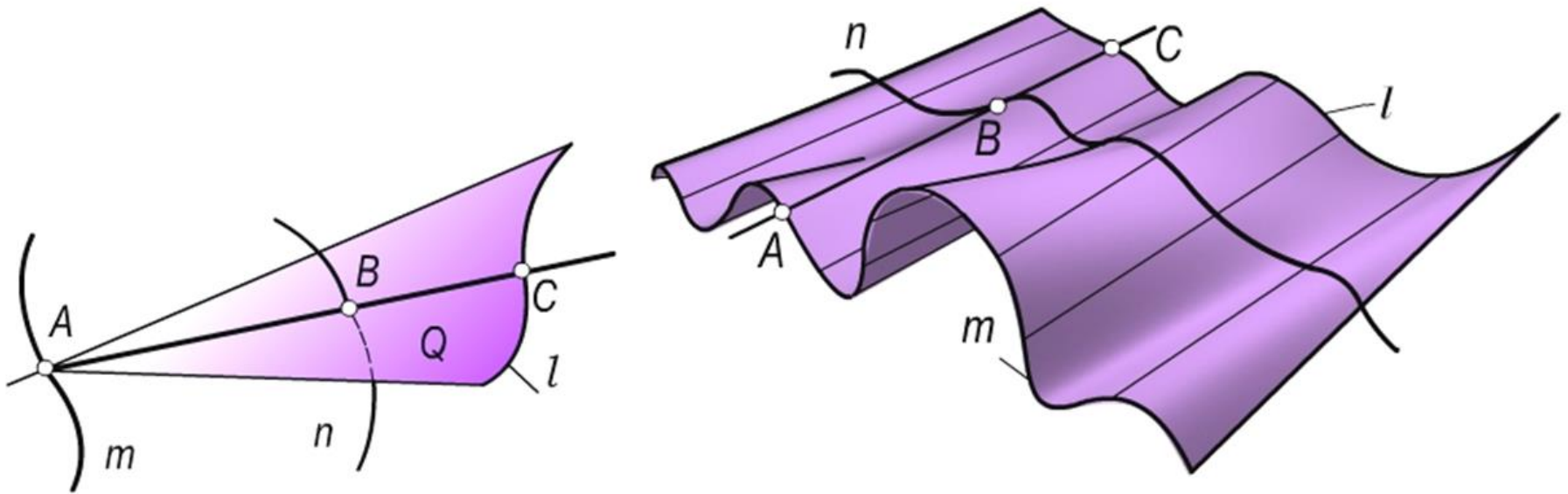


***Mavzu:* Sirtlar. To‘g‘ri chiziqli yoyiluvchi sirtlar. Aylanish sirtlari. Sirtlarda nuqta tanlash. Sirtlarning tekislik bilan kesishuvi. To‘g‘ri chiziqni sirt bilan kesishgan nuqtasi. Sirtlarning o‘zaro kesishish chizig‘i. (Yordamchi kesuvchi tekisliklar va yordamchi kesuvchi sharlar usullari)**

Sirtlar. To'g'ri chizikli yoyiluvchi sirtlar.

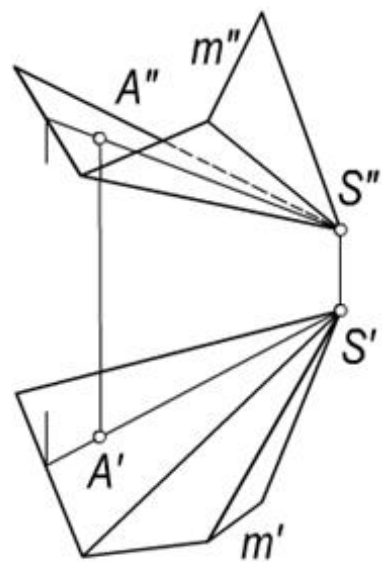
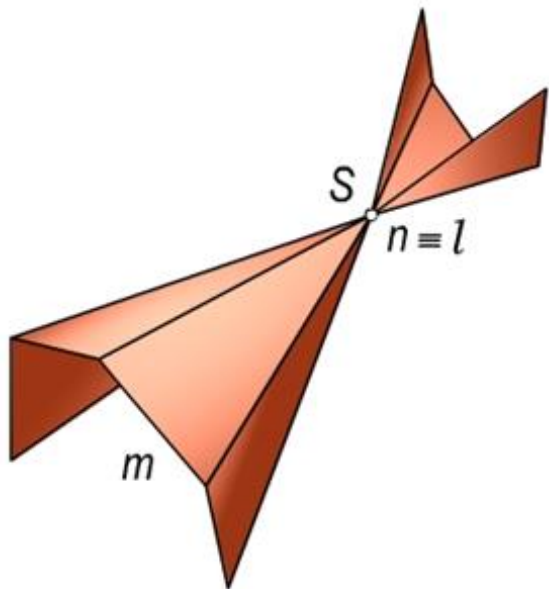
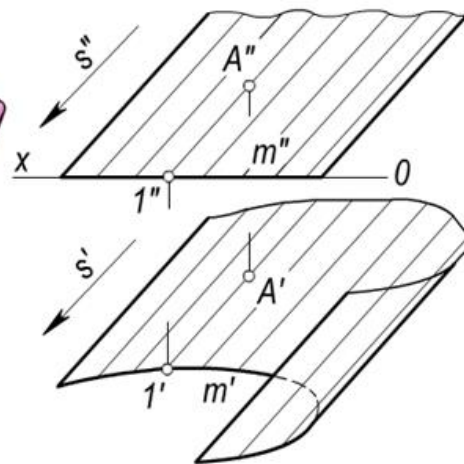
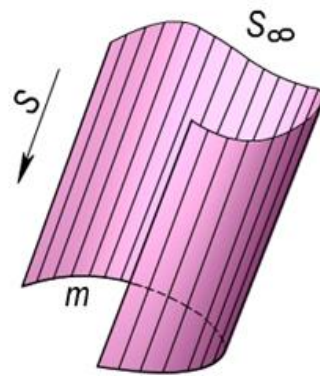
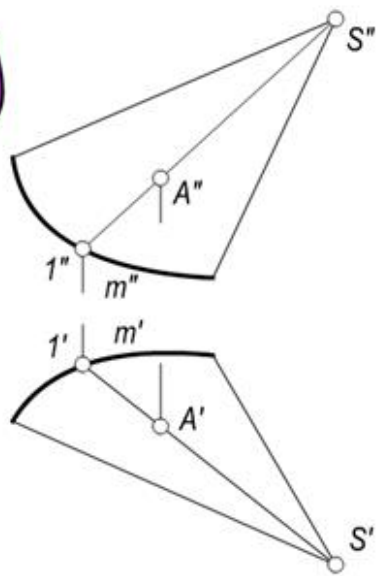
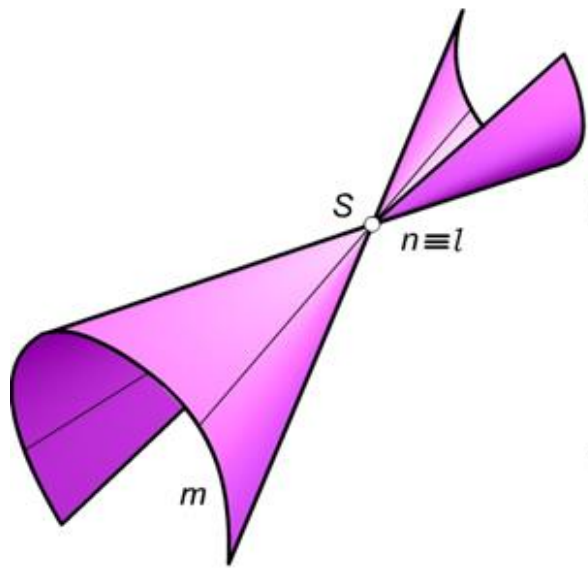
Ta'rif. To'g'ri chiziqning fazoda berilgan uchta (m , n va l) yo'naltiruvchi chiziqlarni kesib o'tib, uzluksiz harakatlanishidan hosil bo'lgan sirt **chizikli sirt** deyiladi.



Chiziqli sirtlar yoyiladigan va yoyilmaydigan sirtlarga bo‘linadi.

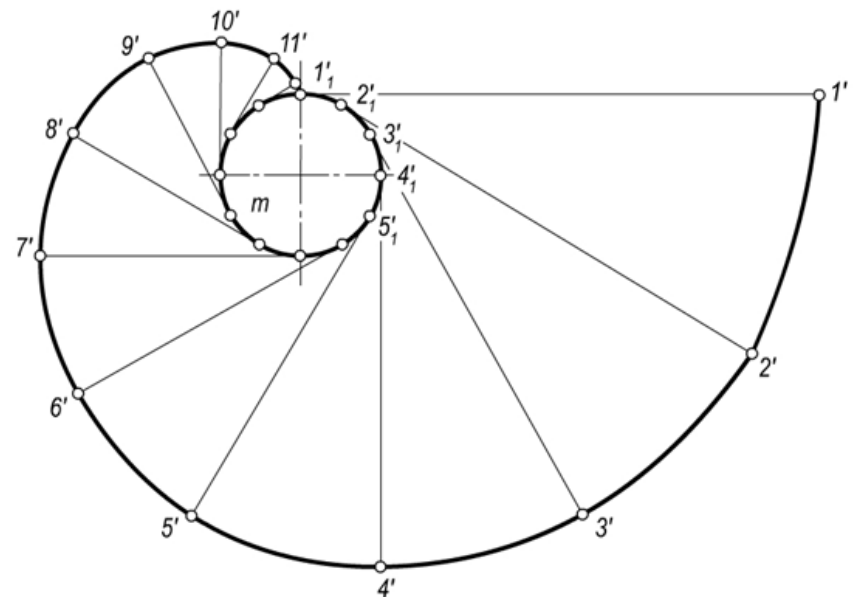
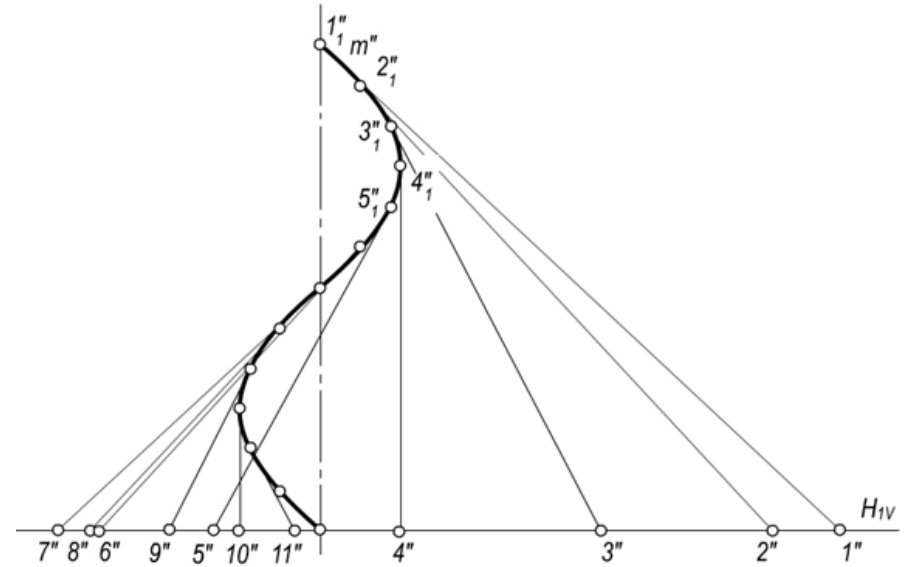
Ta’rif. Cheksiz yaqin turgan ikki qo‘shni yasovchilar (to‘g‘ri chiziq) o‘zaro parallel yoki kesishuvchi bo‘lib, tekis element hosil qilsa, bunday chiziqli sirtlar **yoyiladigan sirtlar** deyiladi. Yoyiladigan sirtlarga konus, silindr sirtlarni misol bo‘la oladi.

Agar cheksiz yaqin turgan ikki qo‘shni yasovchi (to‘g‘ri chiziq) o‘zaro uchrashmas vaziyatda bo‘lsa, bunday chiziqli sirtlar **yoyilmaydigan sirtlar** deyiladi.



Qaytish qirrali yoyiladigan chiziqli sirtlar. Torlar.

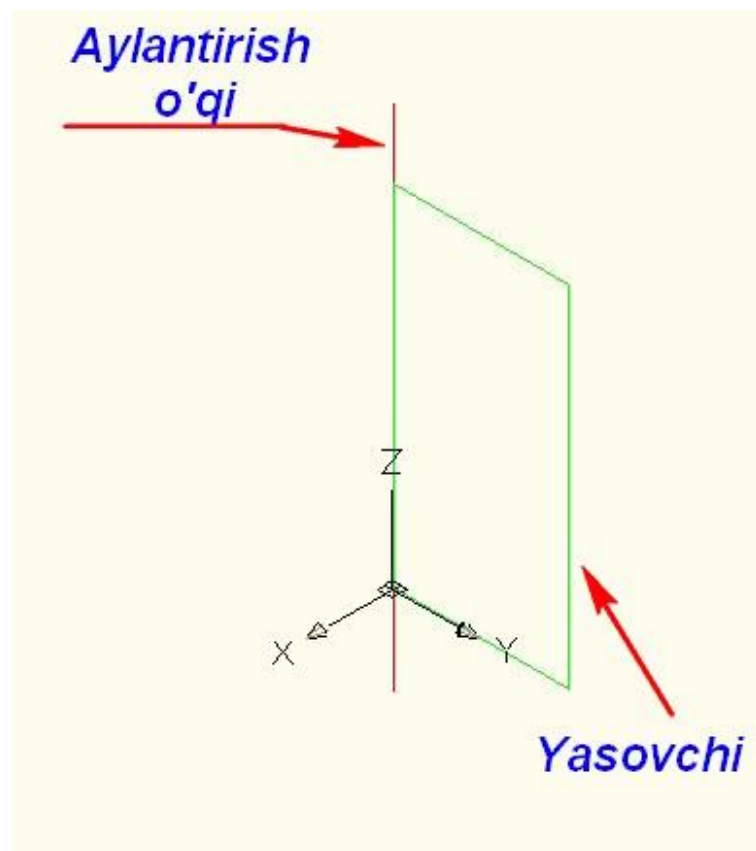
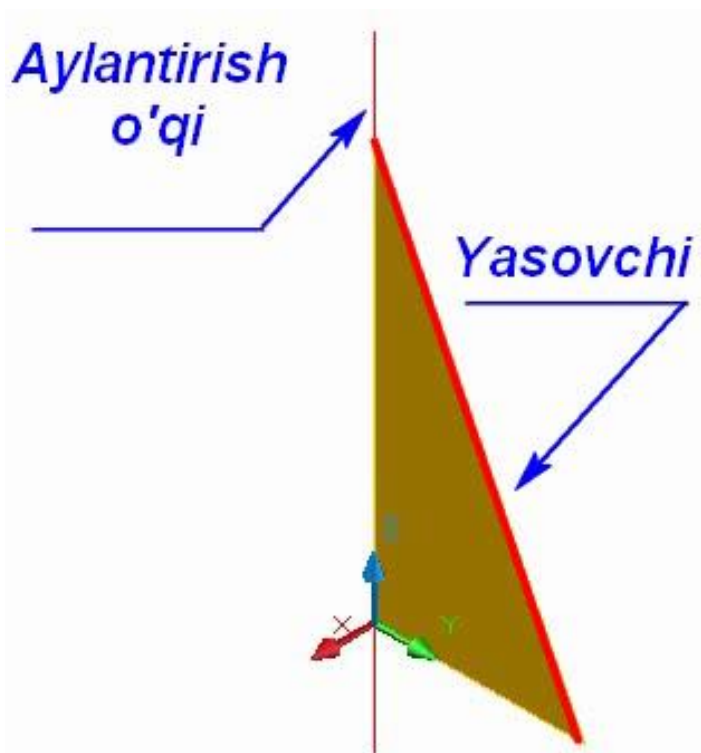
Ta'rif. Biror fazoviy egri chiziqqa urinib o'tuvchi chiziqlar to'plamidan hosil bo'lgan sirt **qaytish qirrali sirt** deb ataladi.



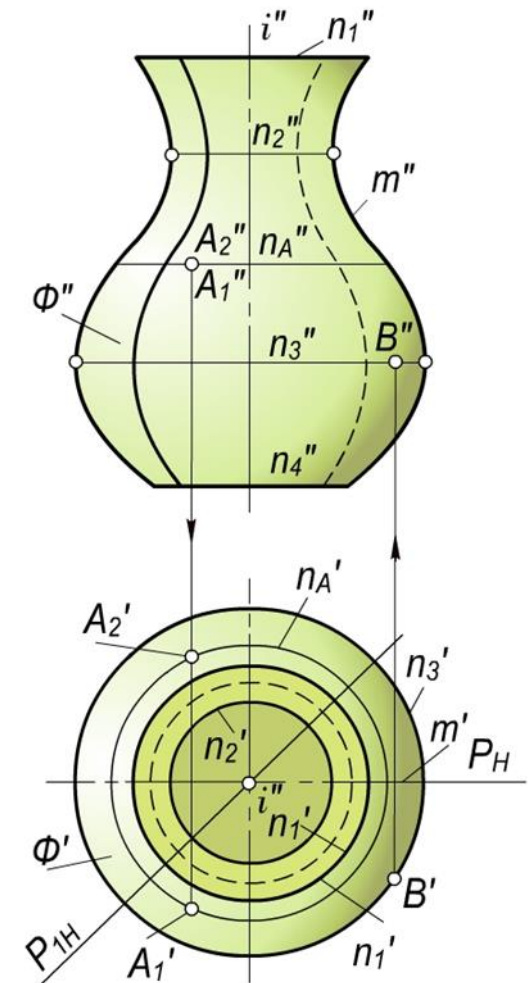
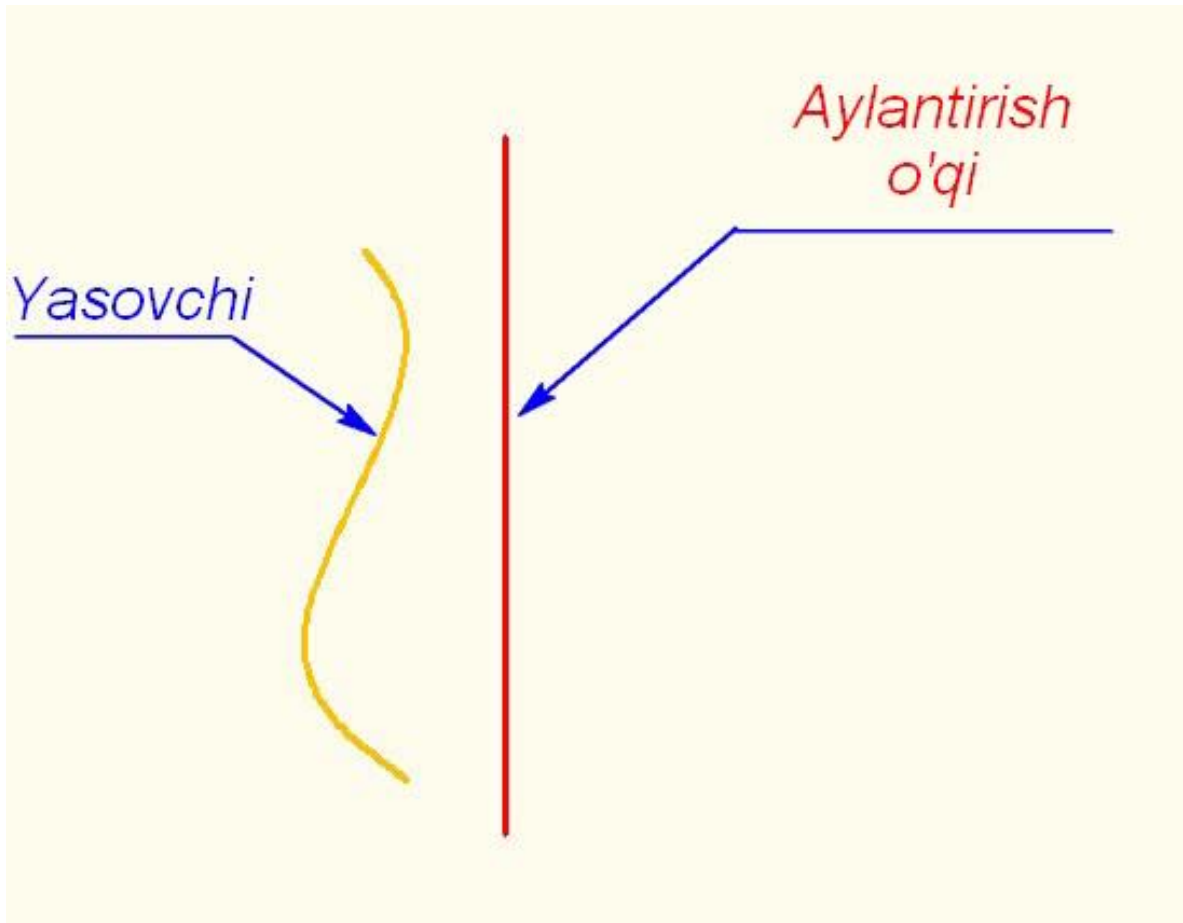
Aylanish sirtlari

Ta'rif. Biror tekis yoki fazoviy chiziqning qo'zg'almas to'g'ri chiziq atrofida aylanishidan hosil bo'lgan sirt *aylanish sirti* deb ataladi.

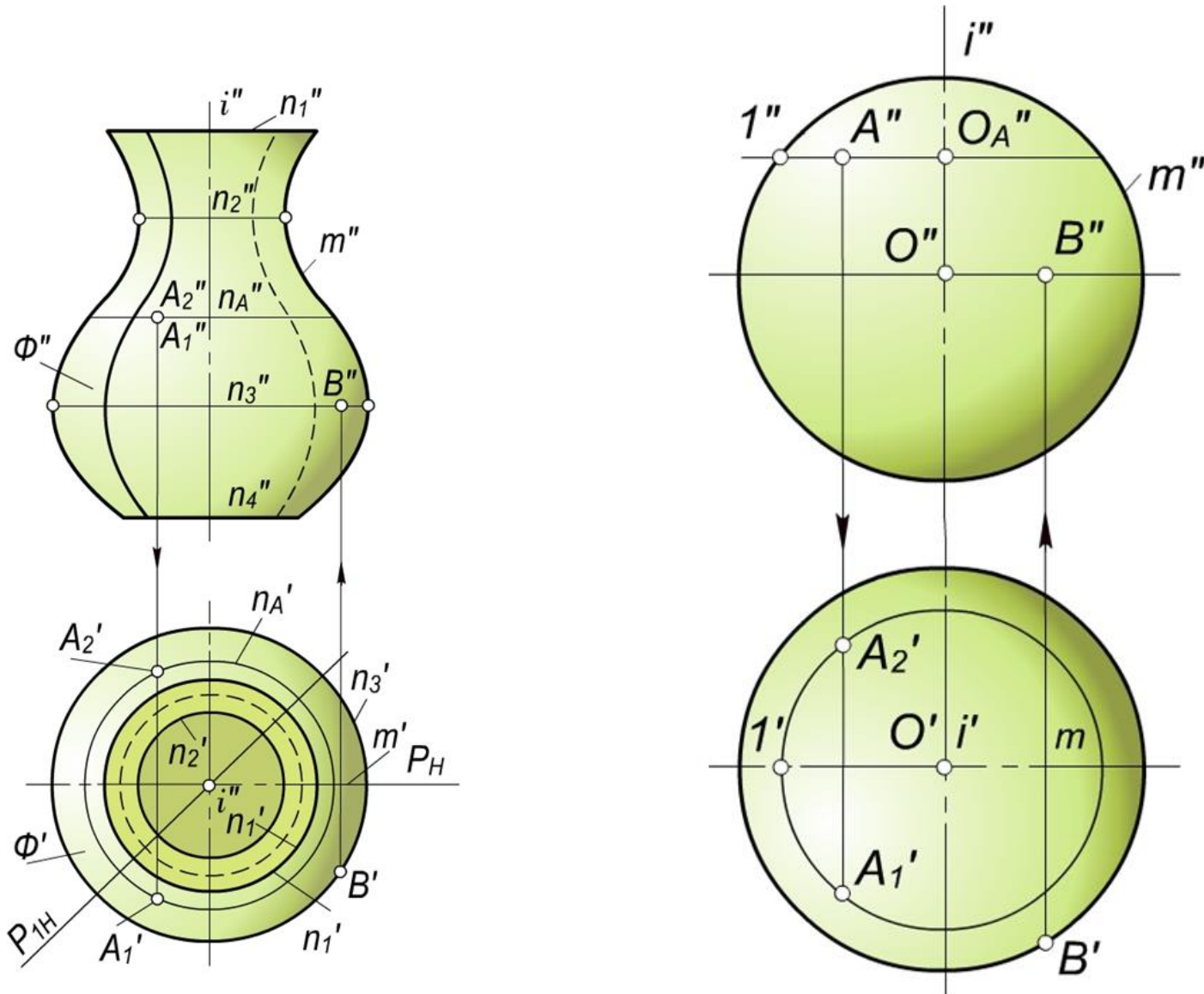
Harakatlanuvchi chiziq sirtning *yasovchisi*, qo'zg'almas to'g'ri chiziq esa uning *aylanish o'qi* deyiladi.



Tekis egri chiziqni aylantirish o'qi atrofida aylantirib aylanish sirtini hosil qilish jarayoni

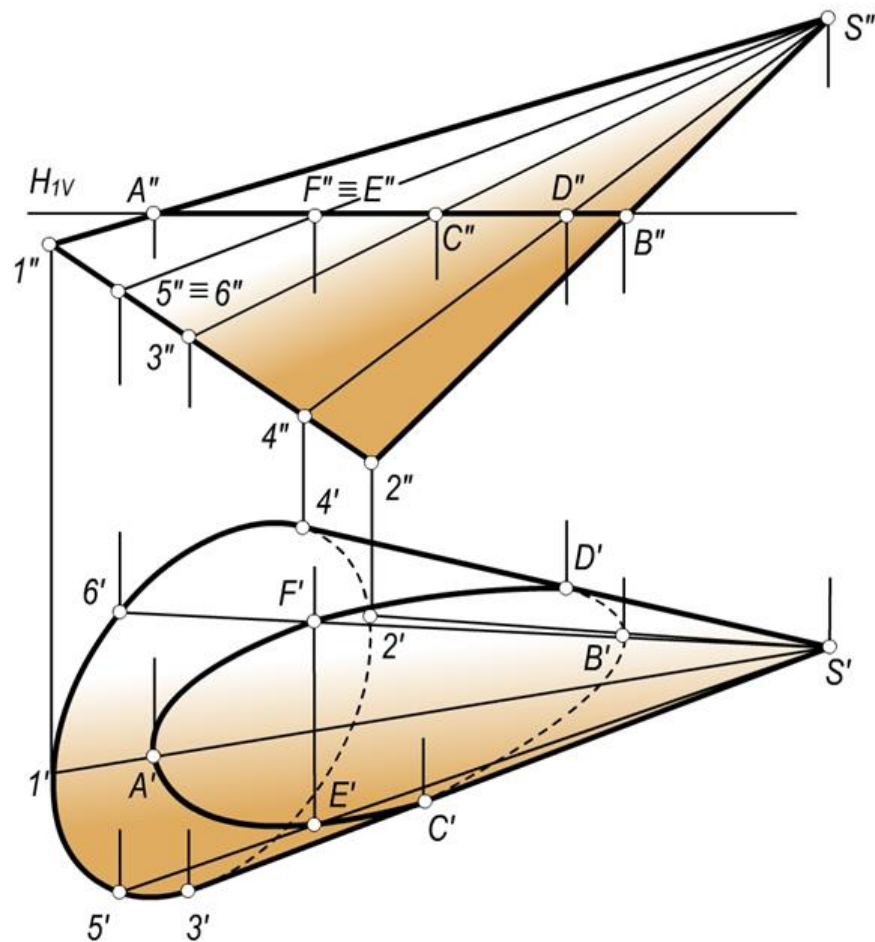


Sirtda nuqta tanlash.

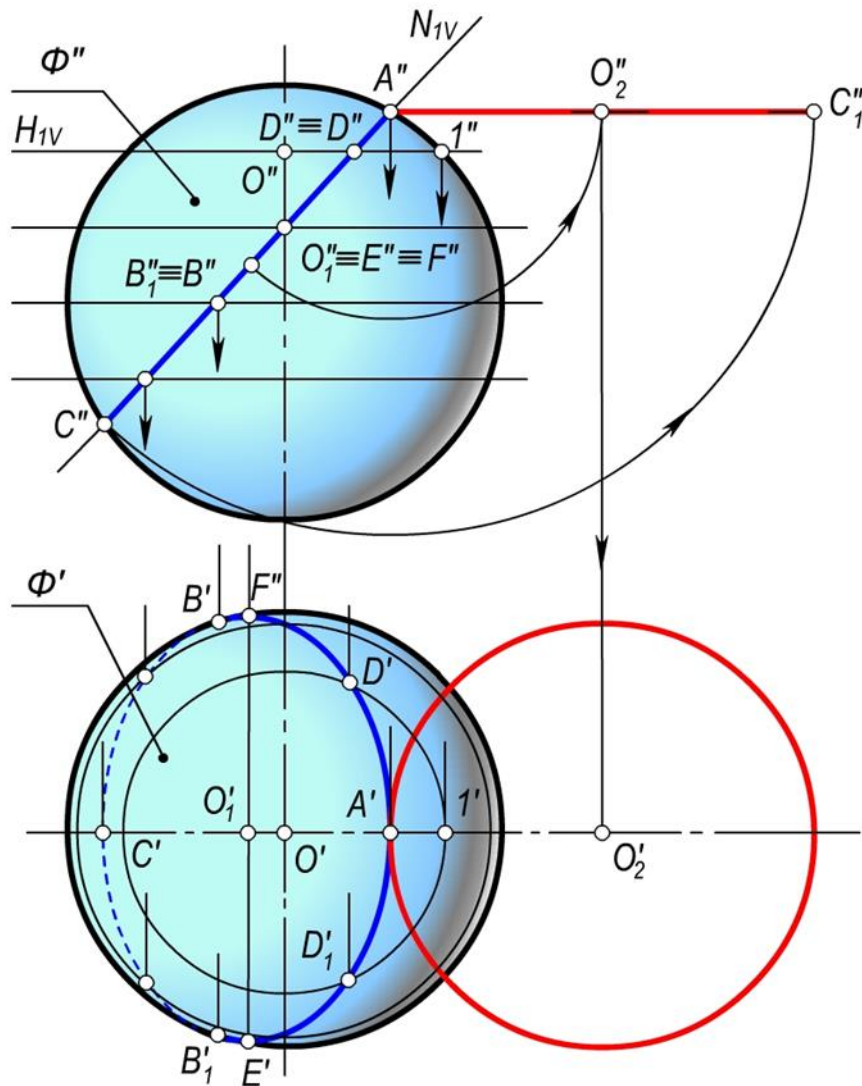


Sirtlarni proyeksiyalovchi tekislik bilan kesishgan chizig‘i

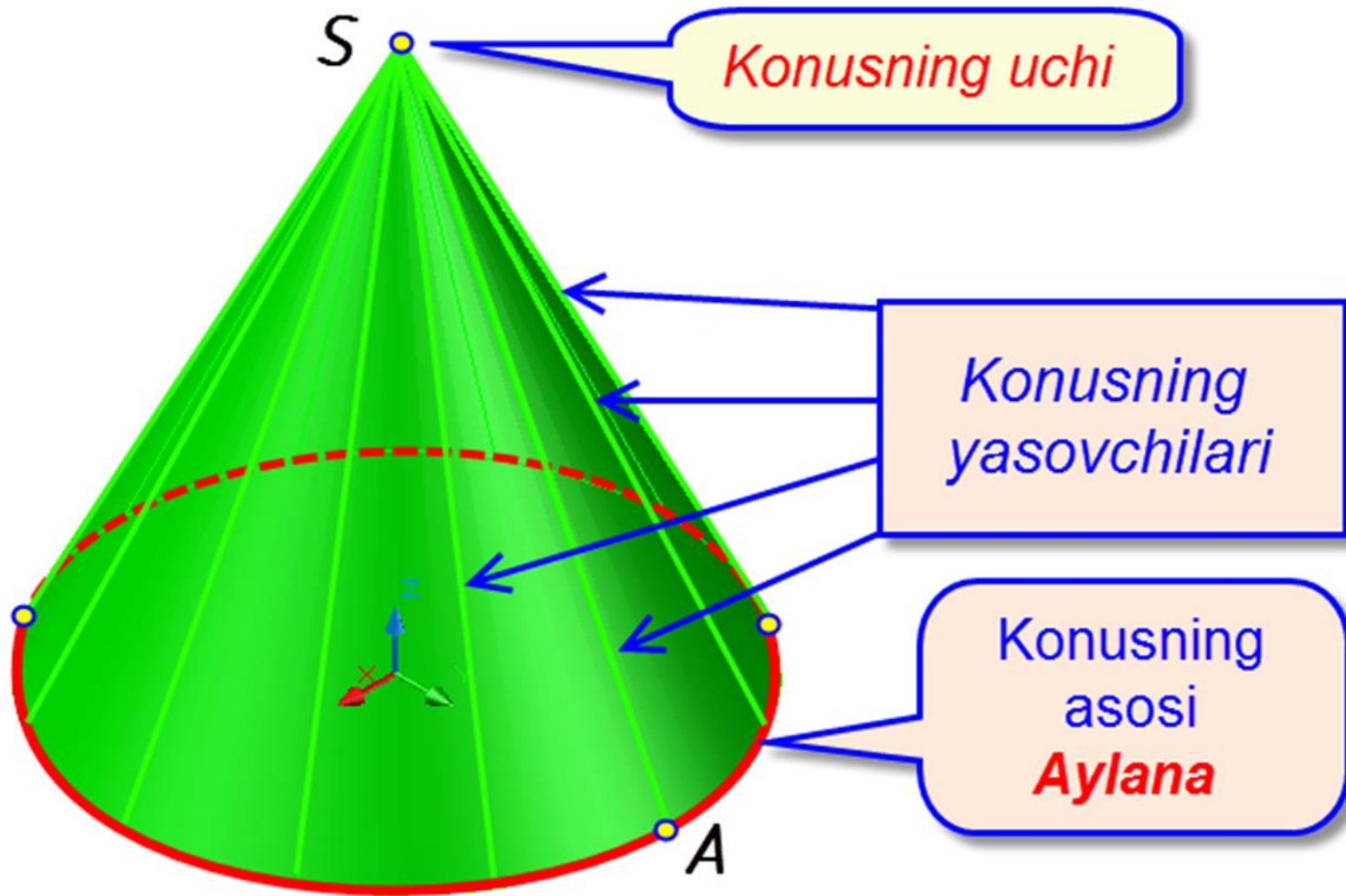
Agar sirtni kesuvchi tekislik proyeksiyalovchi bo‘lsa, kesim chizig‘ining proyeksiyalarini yasash soddalashadi, chunki bu holda kesishish chizig‘ining proyeksiyalaridan biri to‘g‘ri chiziq kesmasidan iborat bo‘ladi.



Misol. Sferaning **N** frontal proyeksiyalovchi tekislik bilan kesishuv chizig‘i proyeksiyalari yasalsin.

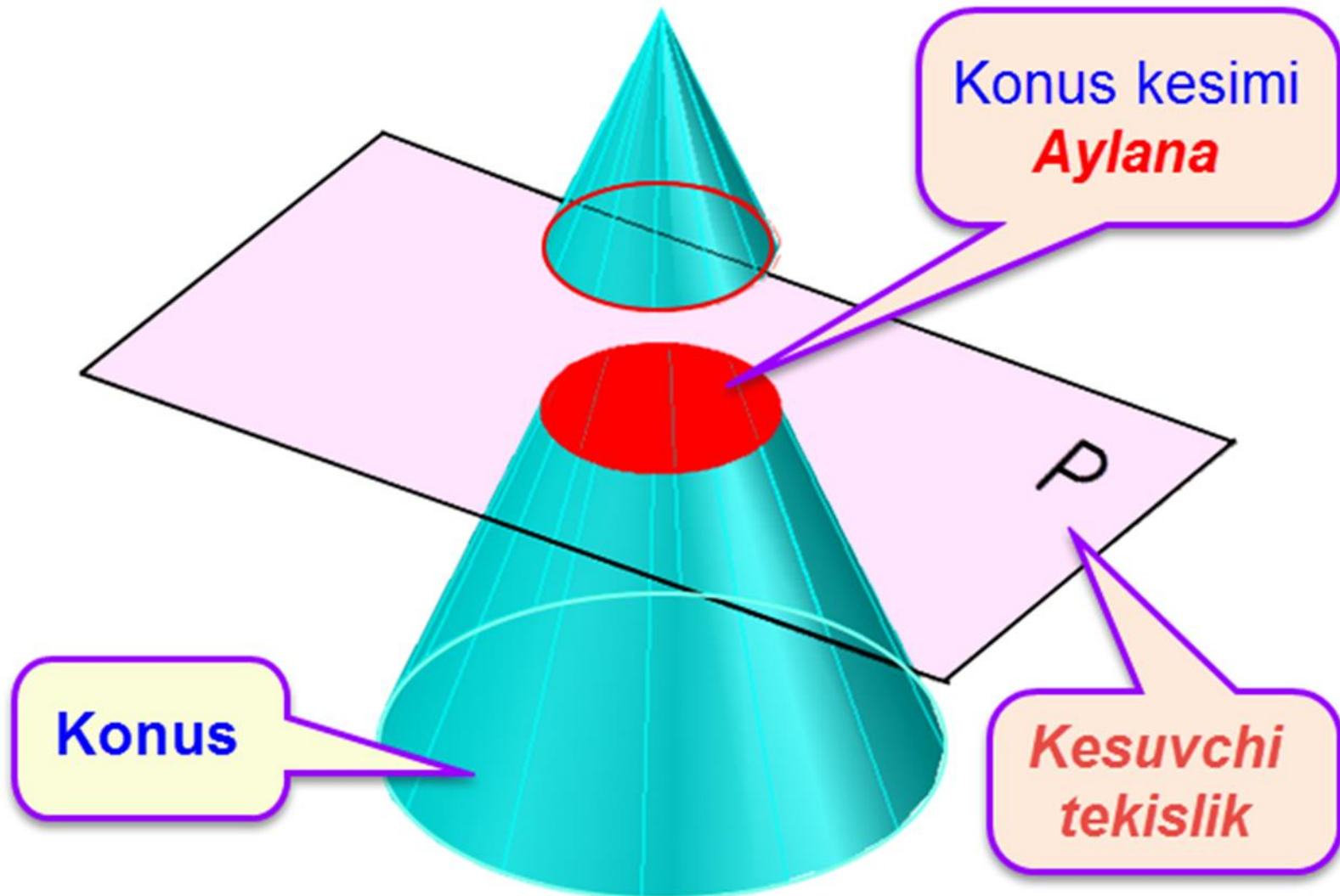


To'g'ri doiraviy konus kesimlari



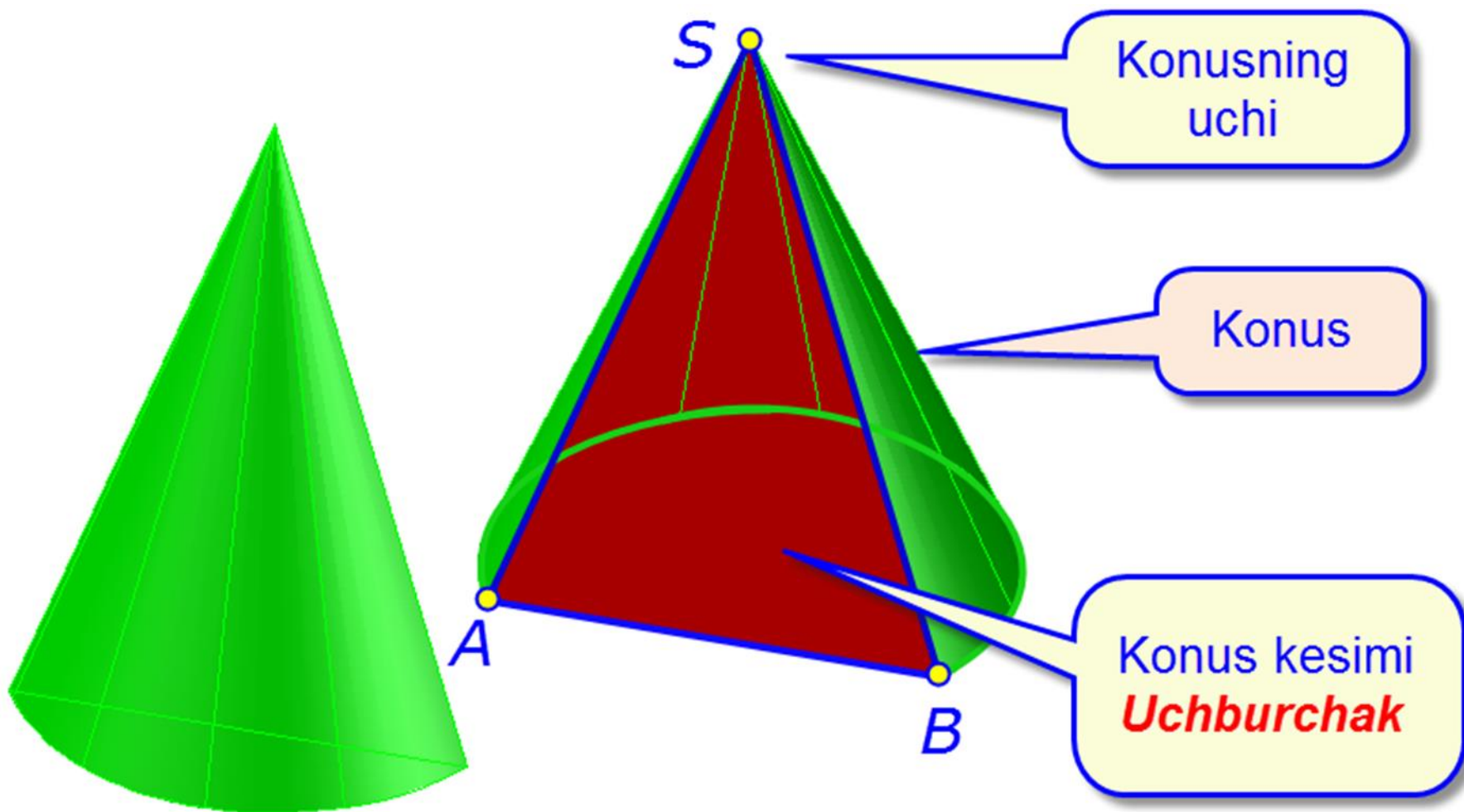
Konus kesimi aylana

Agar, kesuvchi tekislik konusning aylanish o'qiga perpendikulyar joylashib uni kessa, kesim yuzasi **aylanani hosil qiladi**.



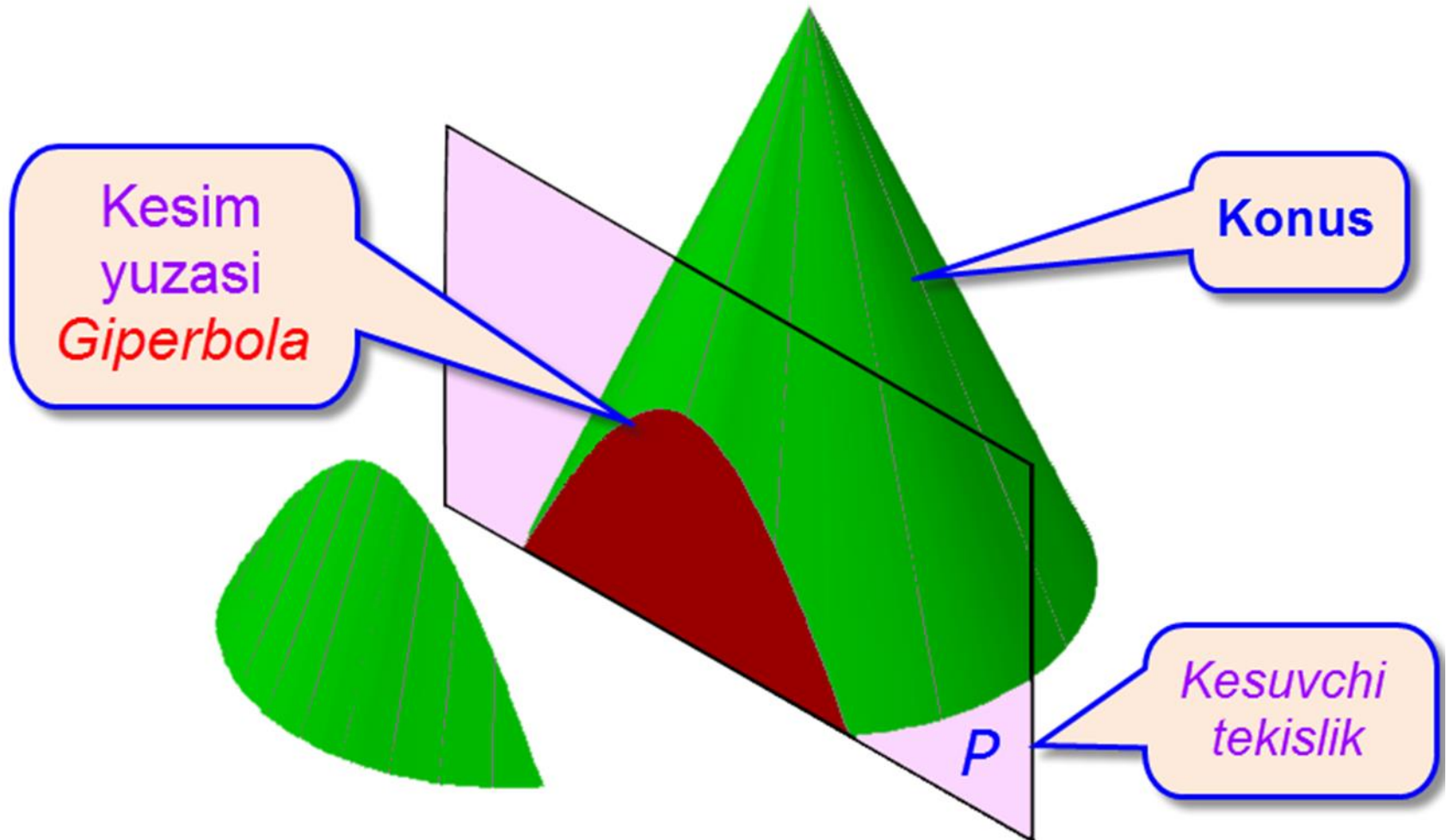
Konus kesimi uchburchak

Agar, kesuvchi tekislik konusning uchi orqali o'tib uni kessa, kesim yuzasi **teng yonli (teng tomonli) uchburchakni hosil qiladi.**



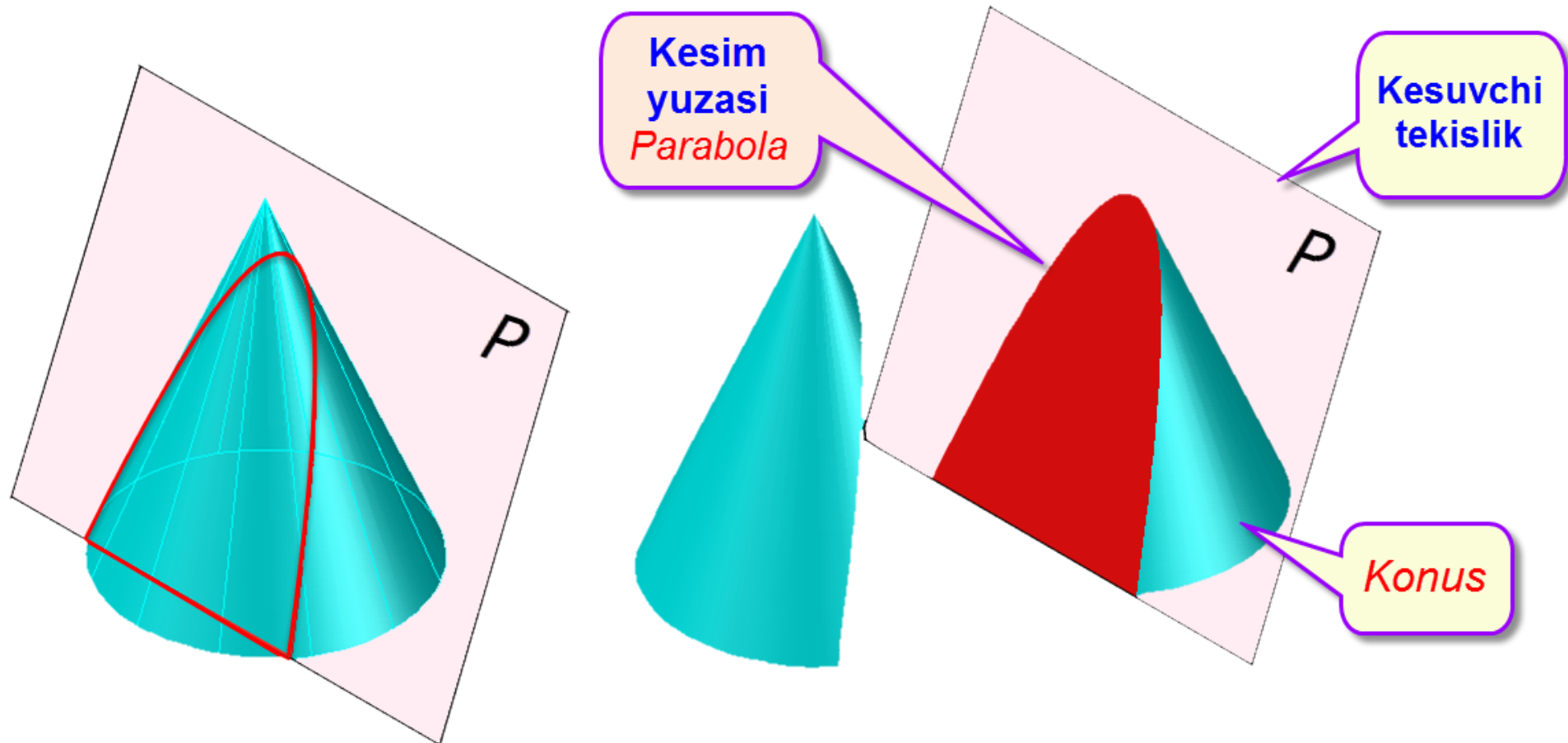
Konus kesimi giperbola

Agar, kesuvchi tekislik konusning asosiga perpendikulyar joylashib kessa, kesim yuzasi **giperbolani hosil qiladi**.



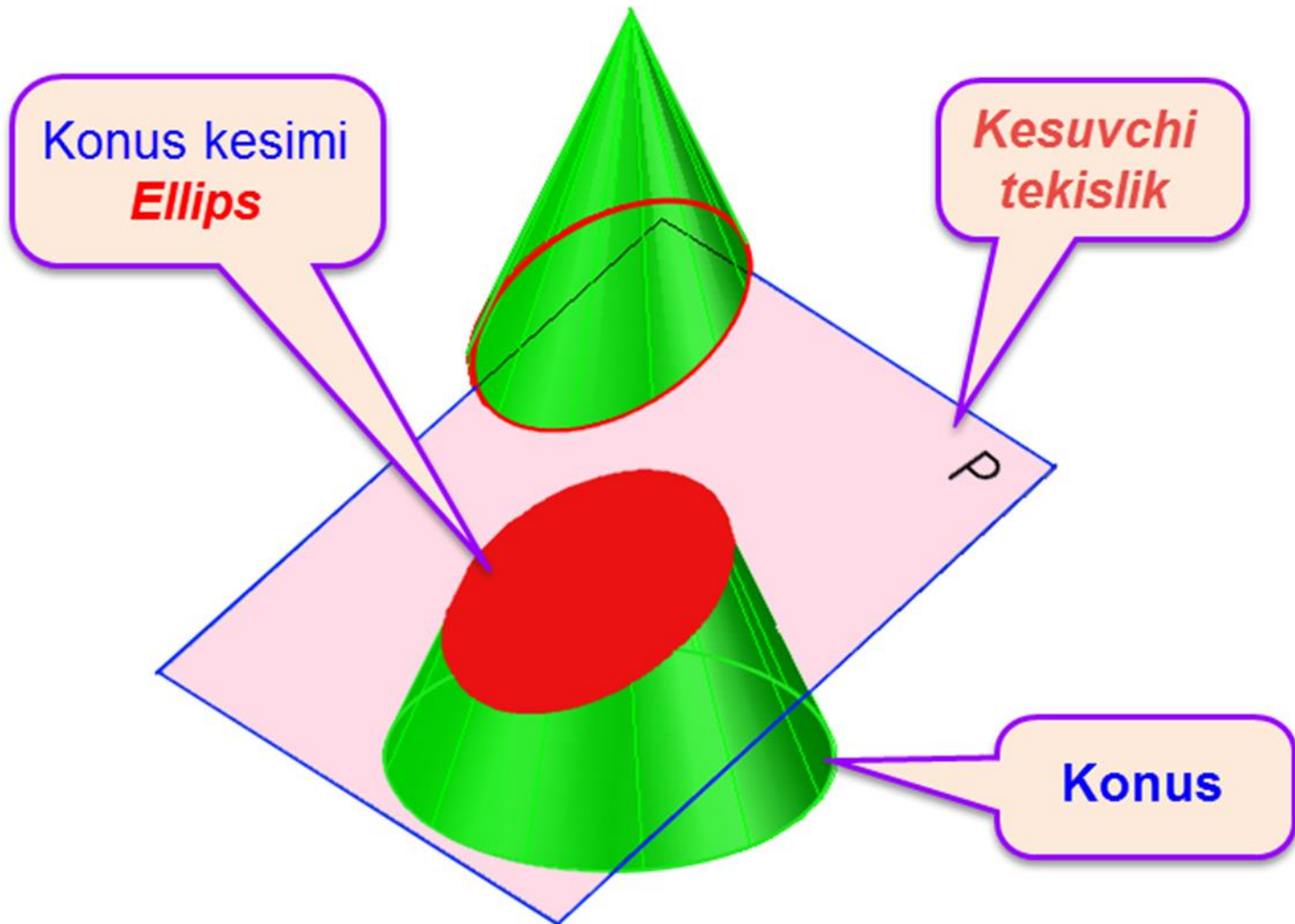
Konus kesimi parabola

Agar, kesuvchi tekislik konusning yasovchilaridan biriga parallel joylashib kessa, kesim yuzasi **parabolani hosil qiladi**.

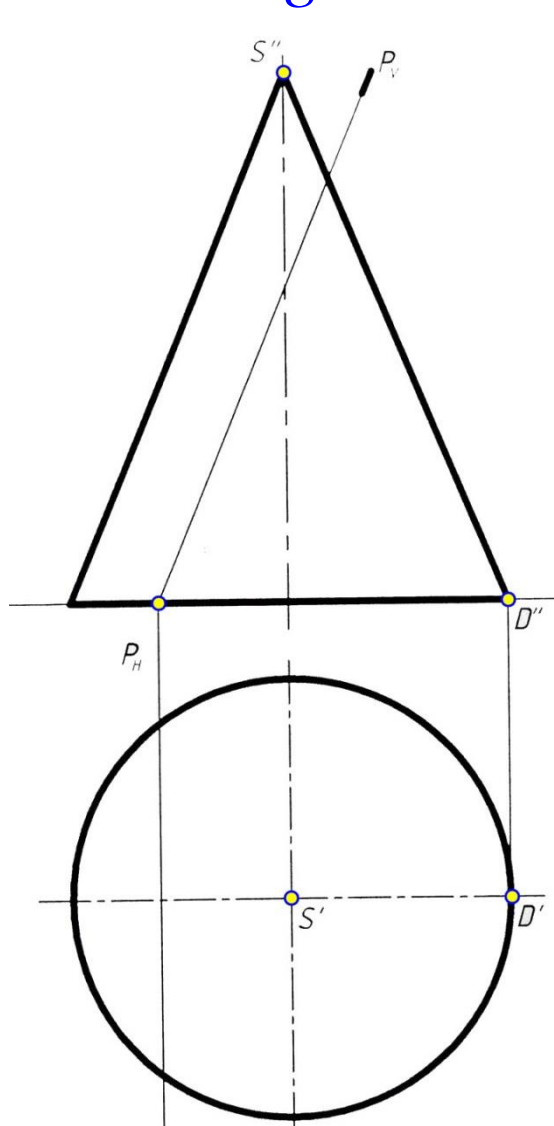


Konus kesimi ellips

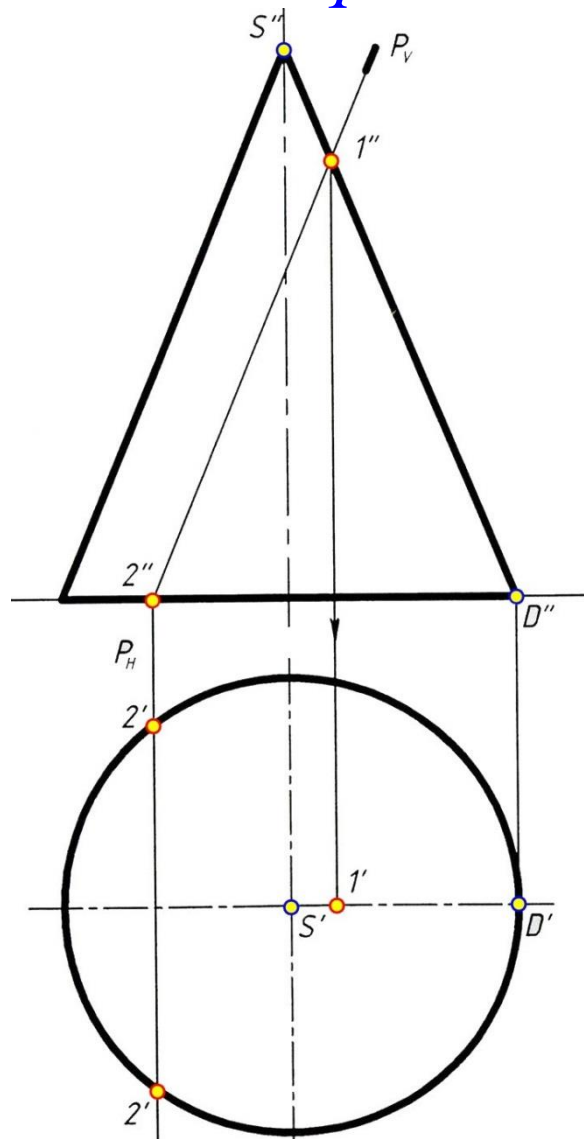
Agar, kesuvchi tekislik konusni og'ma vaziyatda kessa, kesim yuzasi **ellipsni hosil qiladi**.



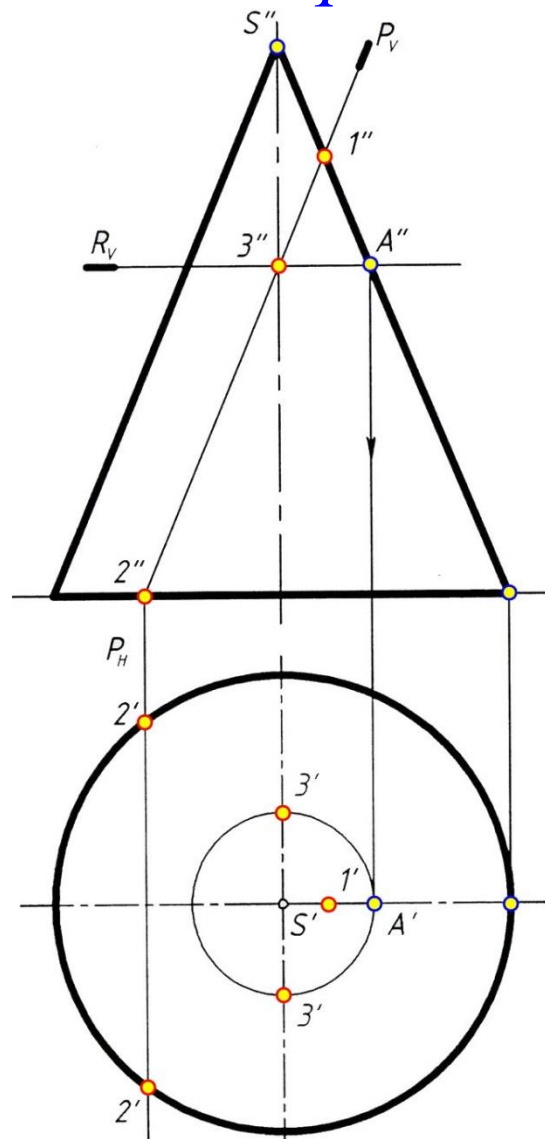
Berilgan



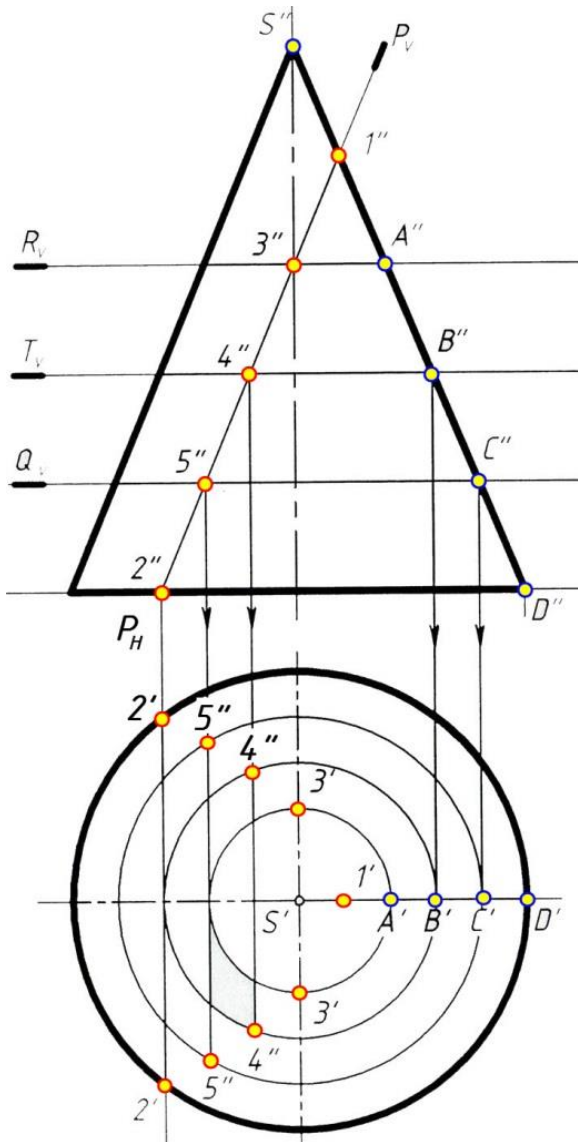
1-bosqich



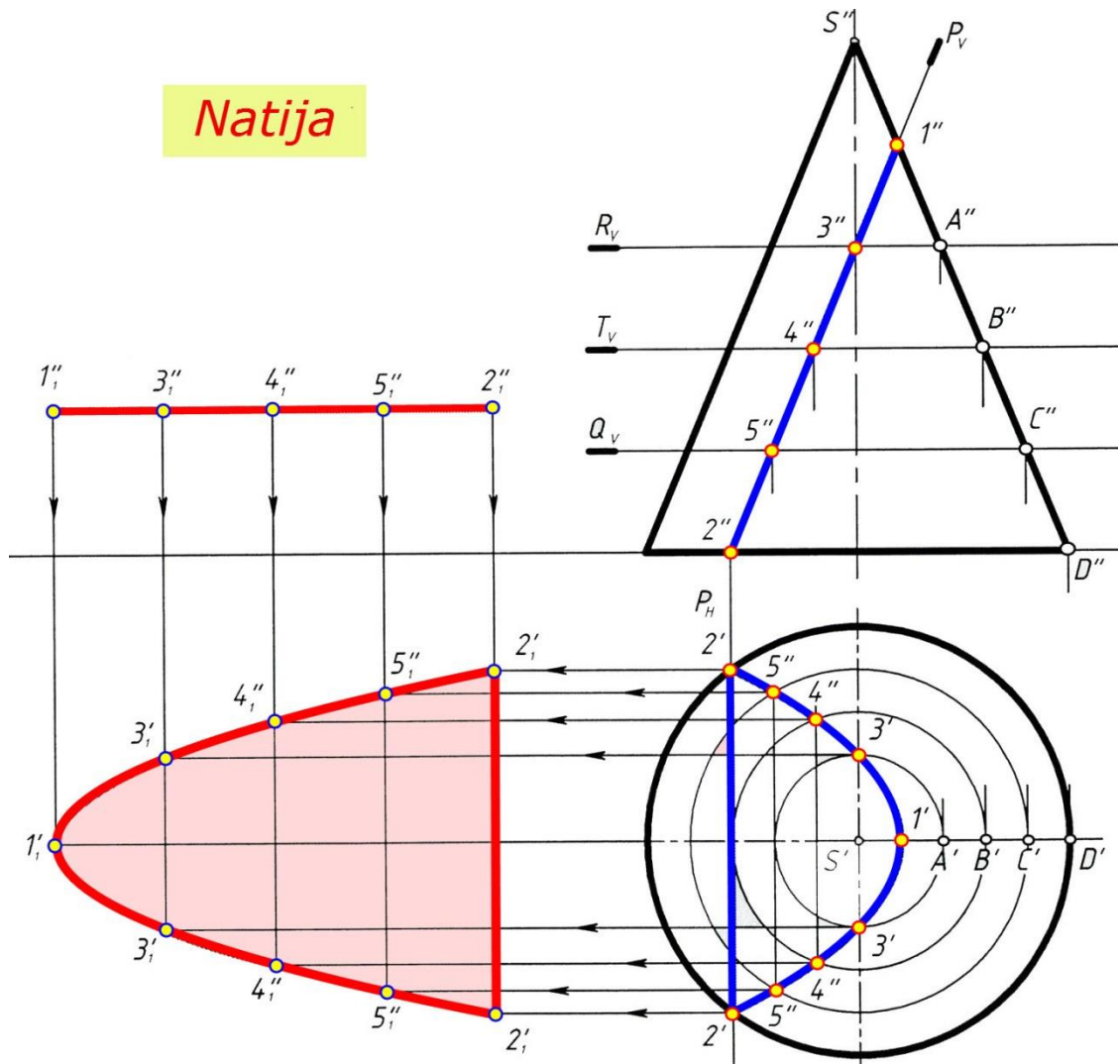
2-bosqich

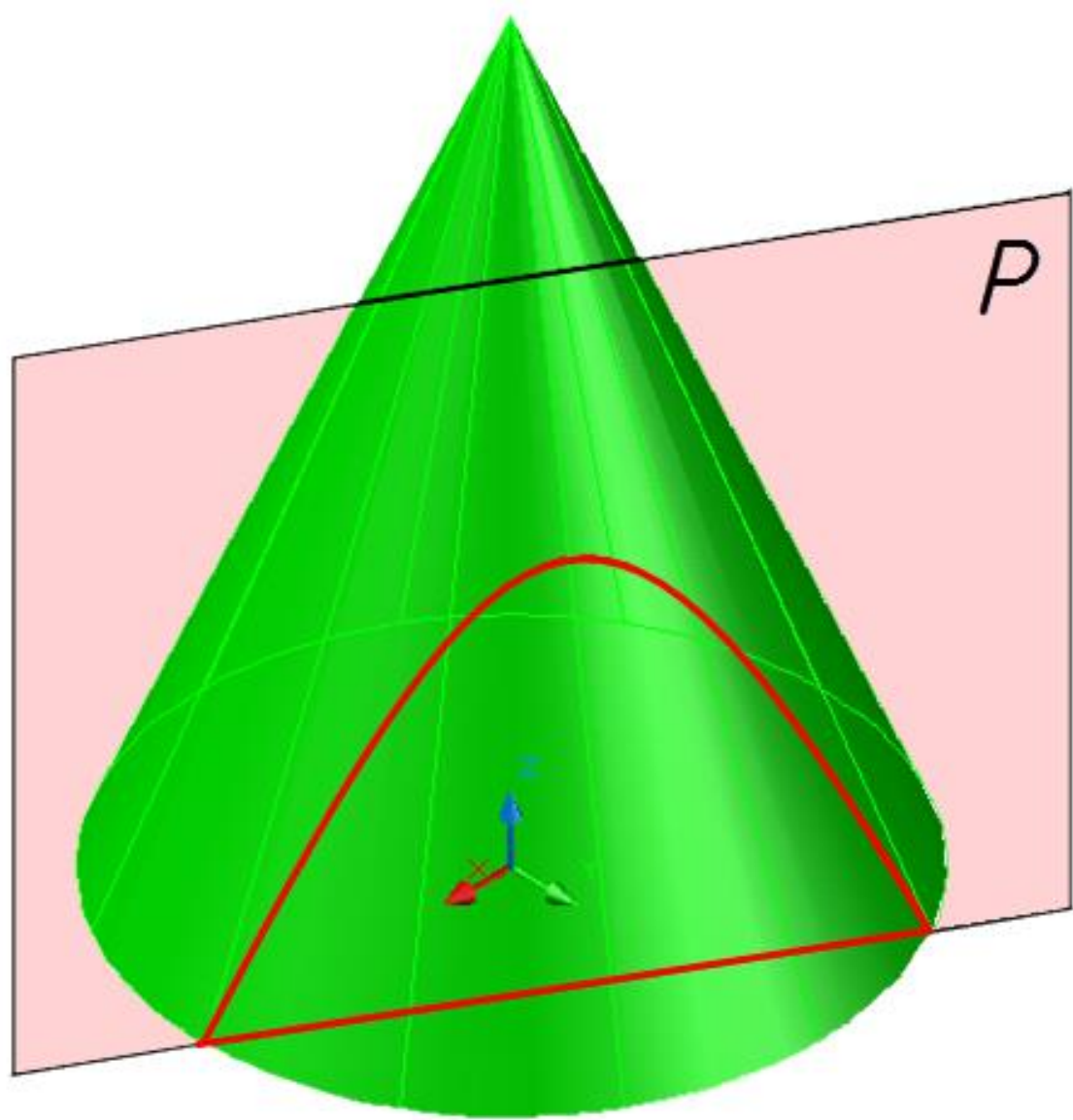


3-bosqich



Natija

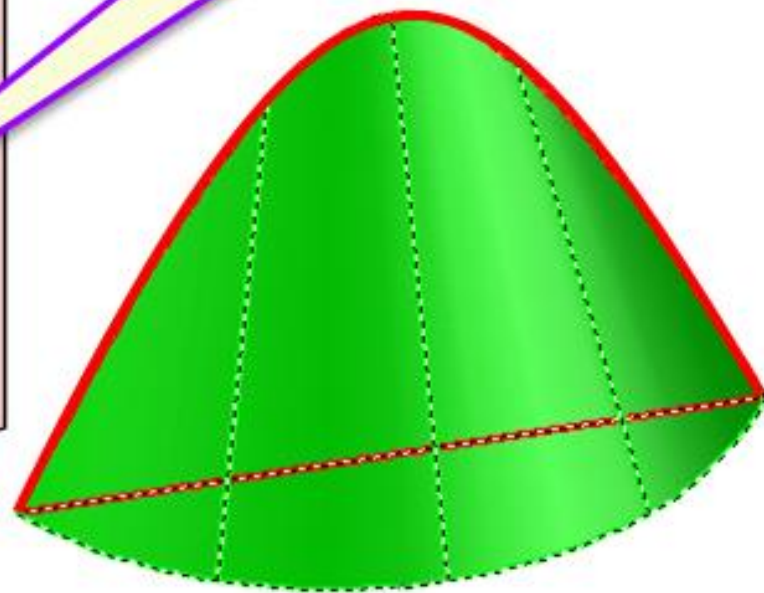




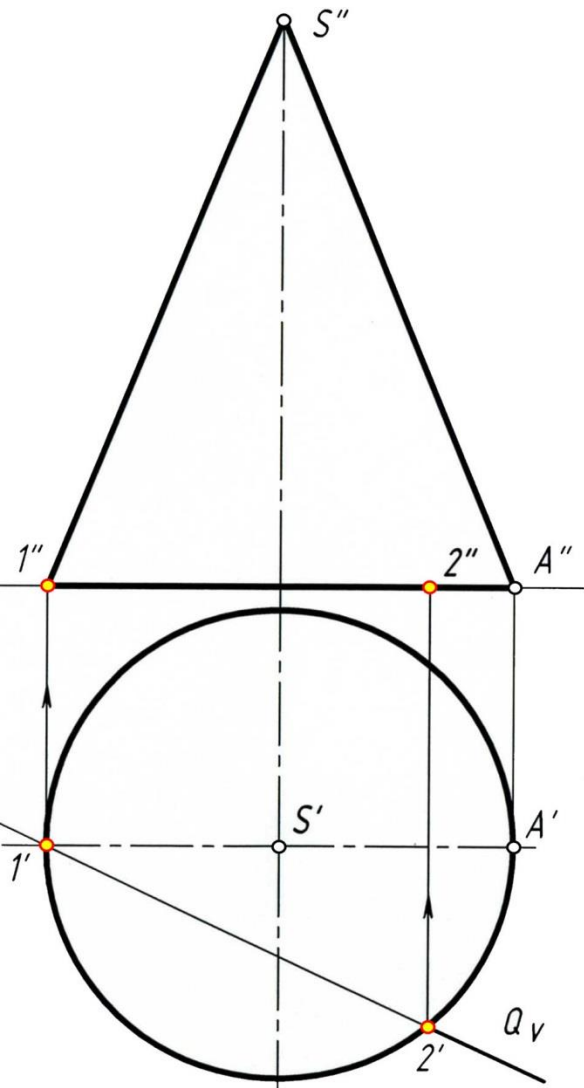
Kesuvchi
tekislik

P

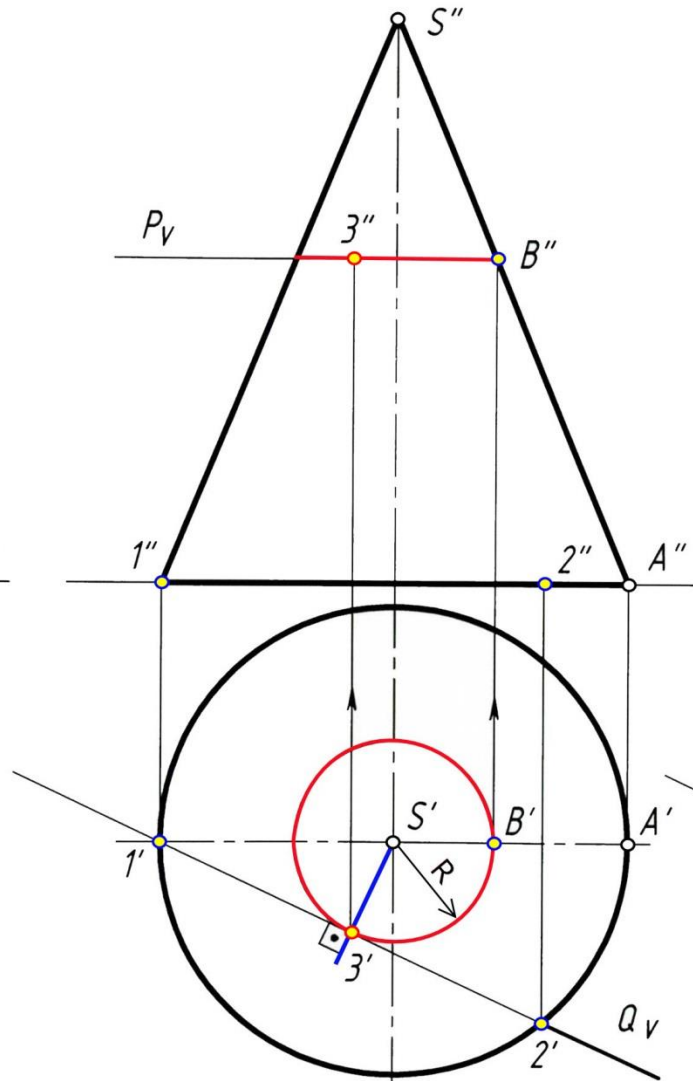
Kesim yuzasi
Giperbola



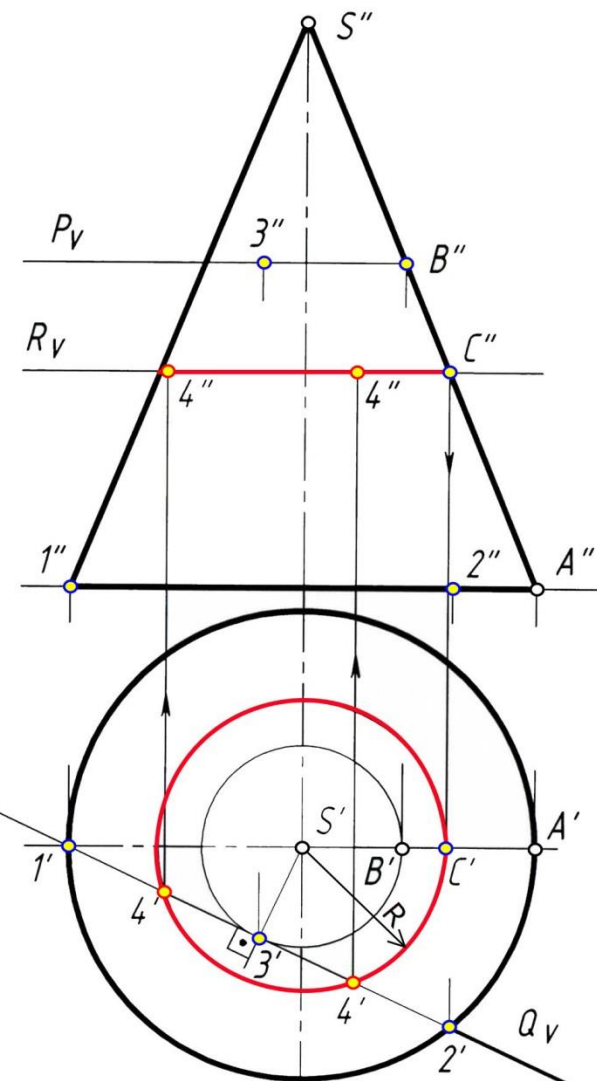
Berilgan



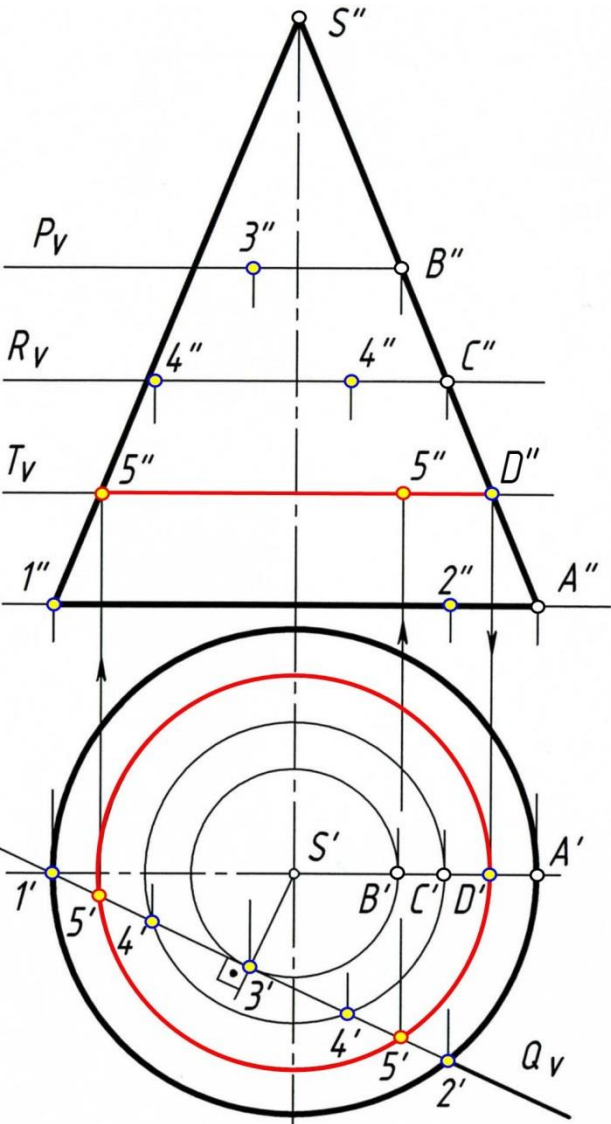
1-bosqich



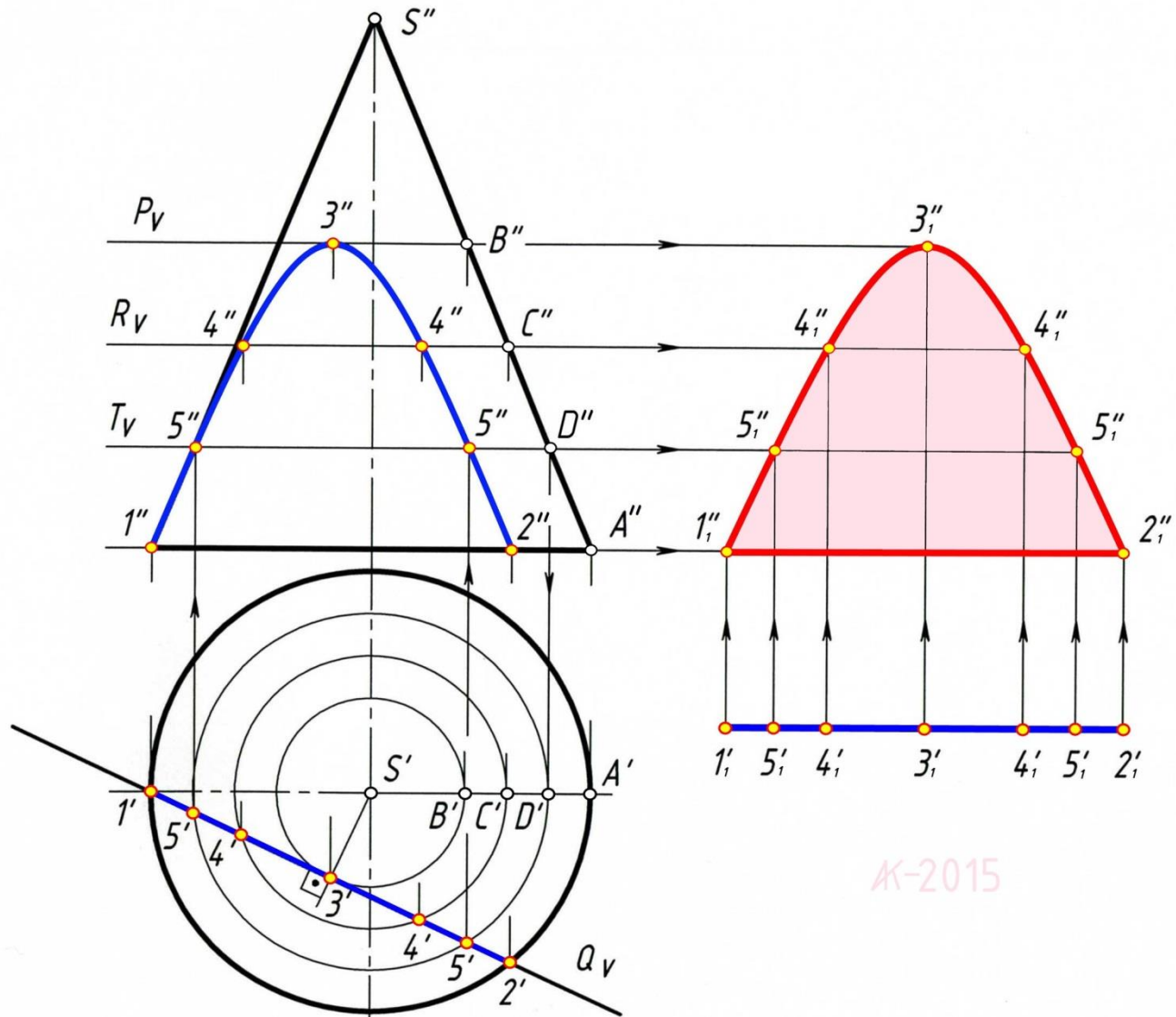
2-bosqich



3-bosqich

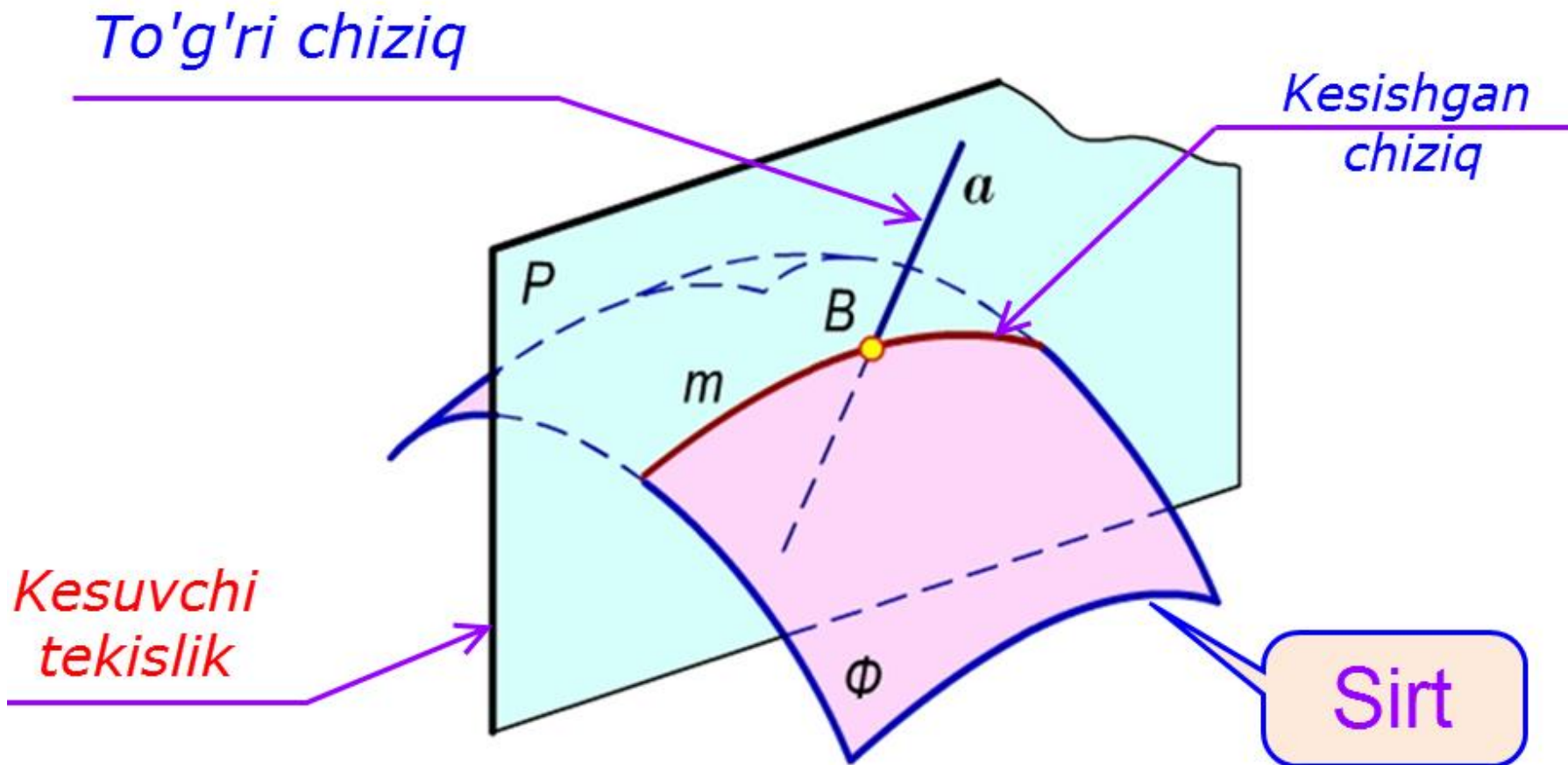


4-bosqich

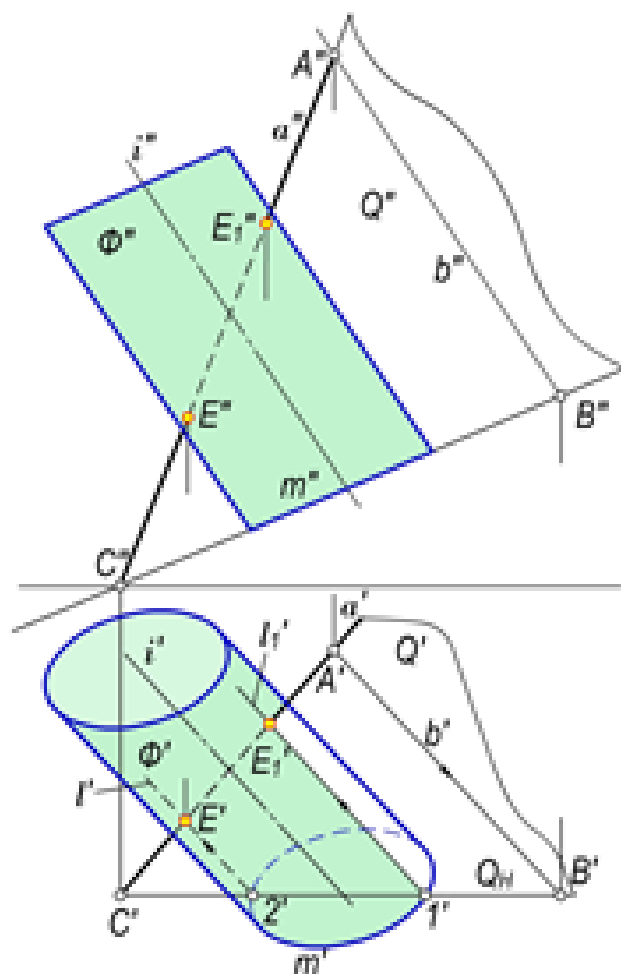
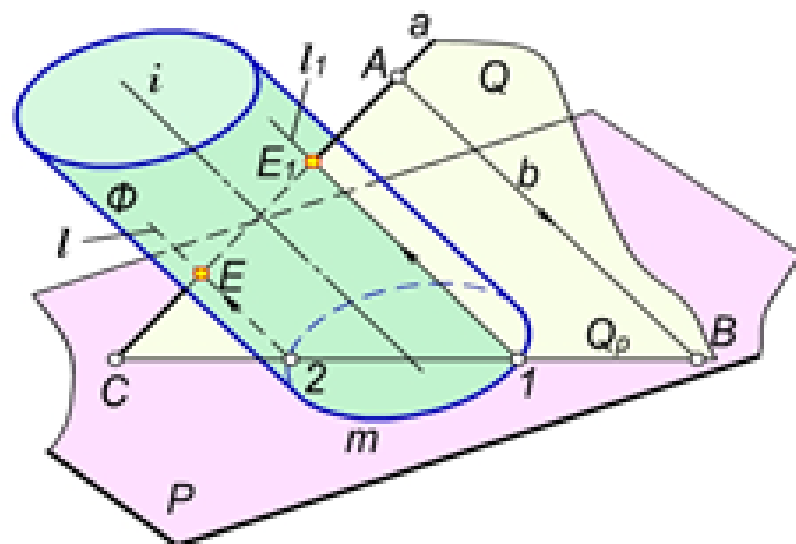


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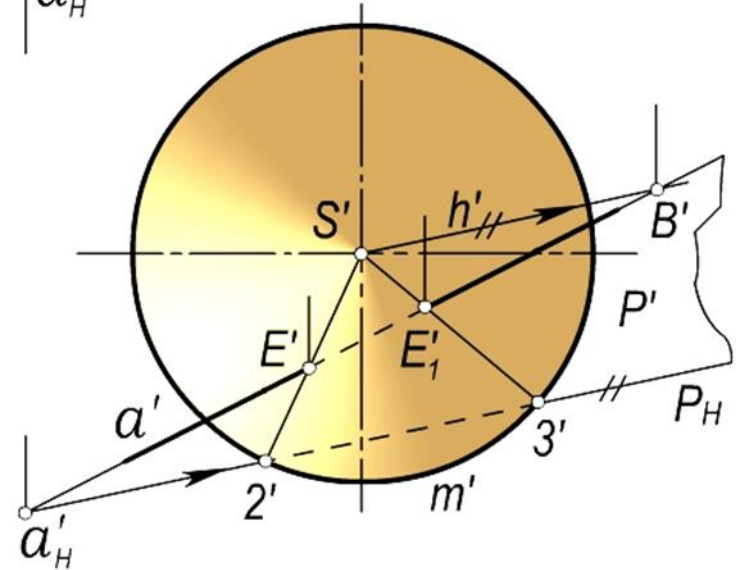
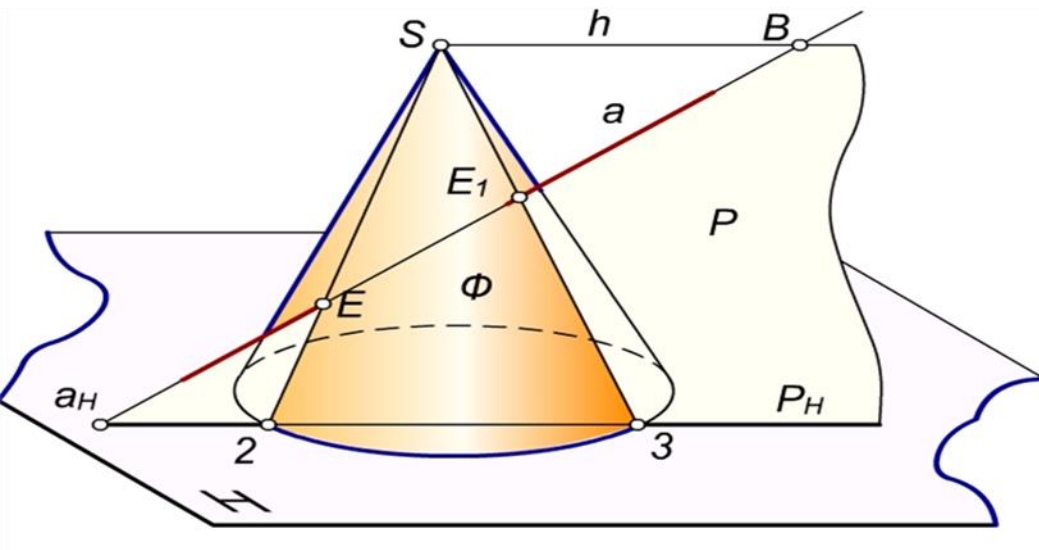
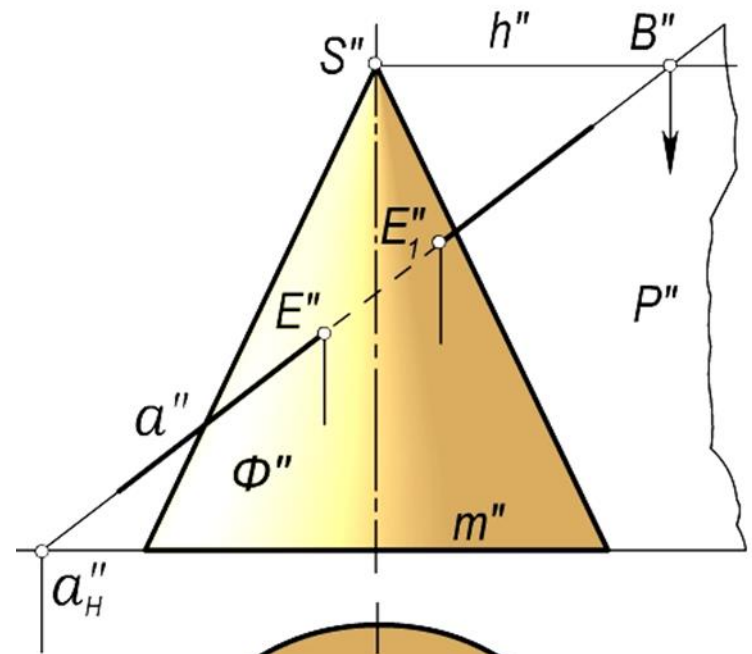
Sirtlarni to'g'ri chiziq bilan kesishishi



1-masala. Berilgan a to'g'ri chiziq bilan F og'ma elliptik silindrning kesishish nuqtalari yasalsin.

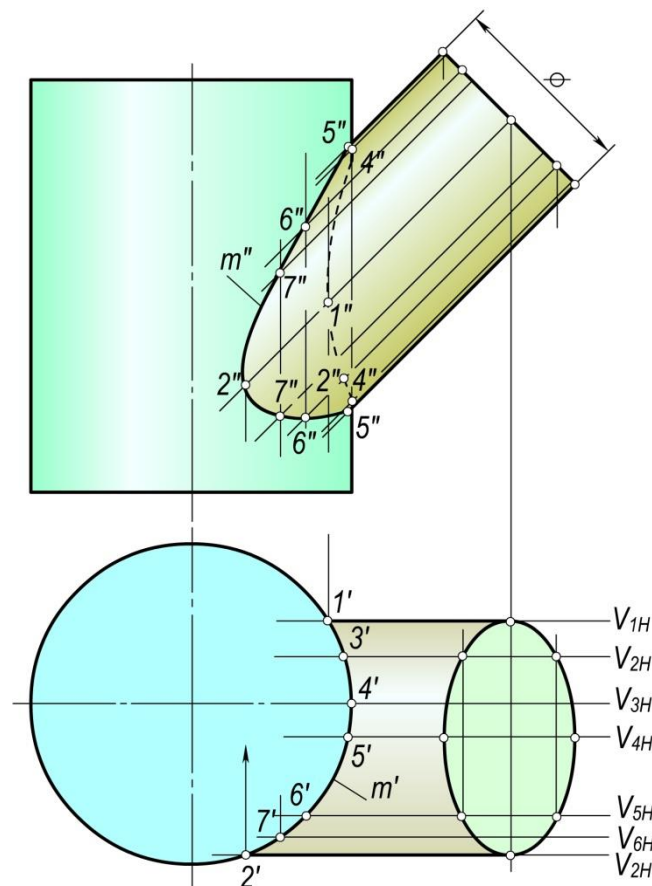


2-masala. Asosi **H** tekislikka tegishli bo‘lgan to‘g‘ri doiraviy konus sirti bilan **a** to‘g‘ri chiziqning kesishish nuqtalari aniqlansin.



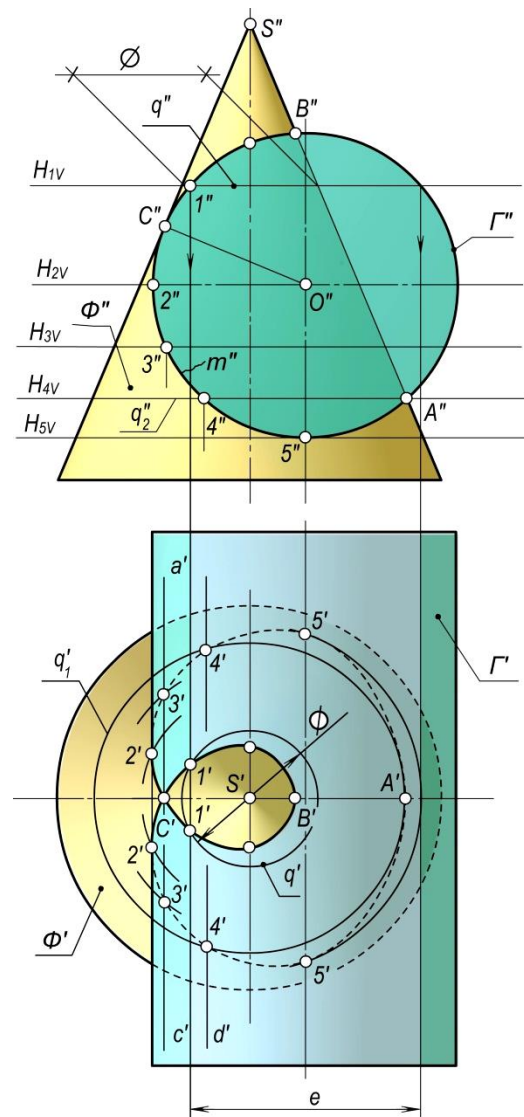
O'qlari bir tekislikda yotmaydigan aylanish sirtlarining o'zaro kesishishi. Parallel kesuvchi tekisliklar usuli

- Agar ikki kesishuvchi sirtlarning o'qlari o'zaro kesishmasdan, ulardan biri biror proyeksiyalar tekisligiga perpendikulyar bo'lib, ikkinchi sirtning o'qi ikkinchi proyeksiyalar tekisligiga perpendikulyar yoki parallel bo'lsa, u holda bu sirtlarning kesishish chizig'ini yasashda parallel kesuvchi tekisliklar usulidan foydalaniladi. Parallel kesuvchi tekisliklarni proyeksiyalar tekisliklaridan birortasiga parallel qilib olinadi.

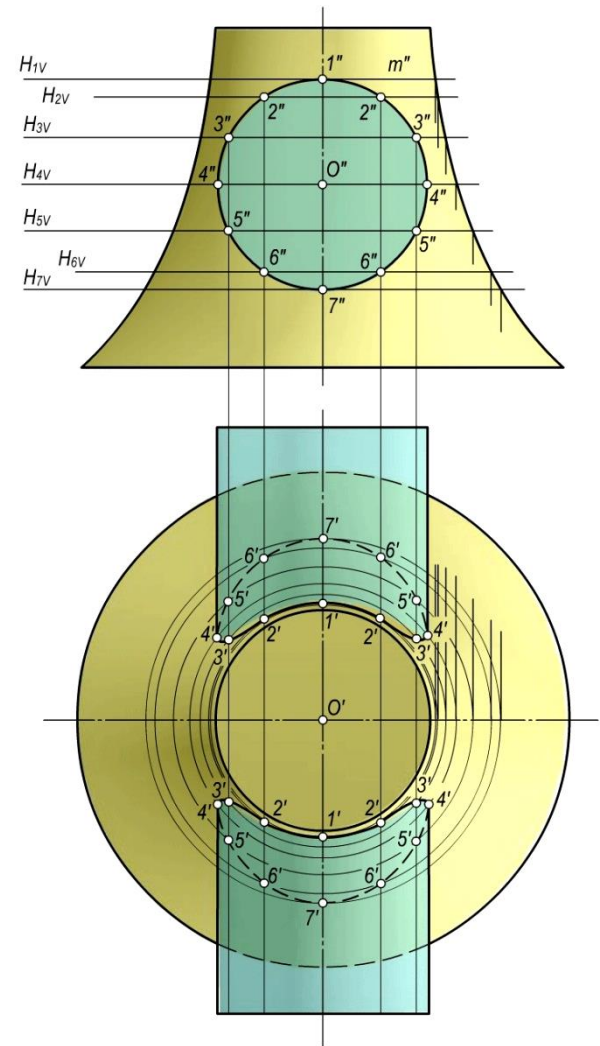


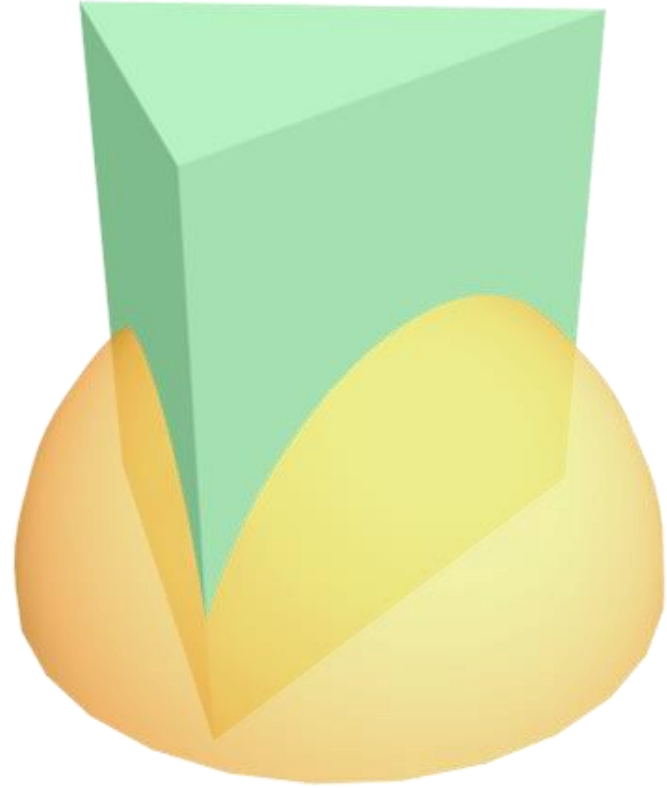
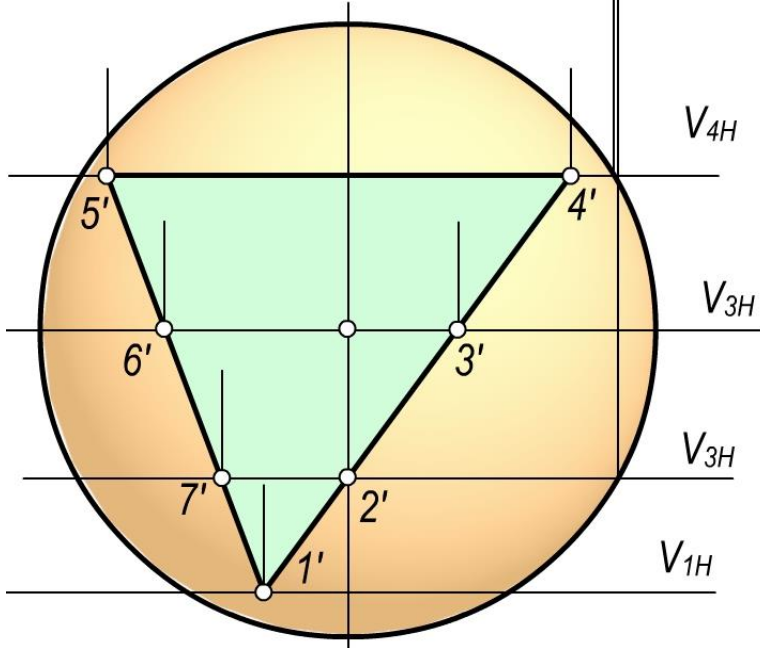
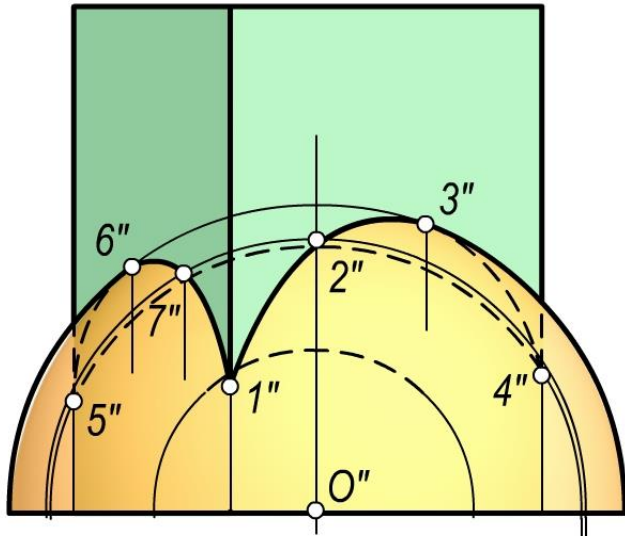
O'qlari uchramas va H yoki V ga perpendikulyar bo'lgan aylanish sirtlarining o'zaro kesishish chizig'ini yasash

- Kesishuvchi sirtlardan doiraviy silindr o'qi V tekislikka va doiraviy konus o'qi H tekislikka perpendikulyar bo'lganda yordamchi parallel kesuvchi tekisliklar gorizont tekisliklar bo'ladi. Bu tekisliklar konusni aylanalar va silindrni yasovchilari bo'yicha kesadi. Hosil bo'lgan aylana va yasovchilar o'zaro kesishib, kesishish chizig'ining nuqtalarini hosil qiladi.

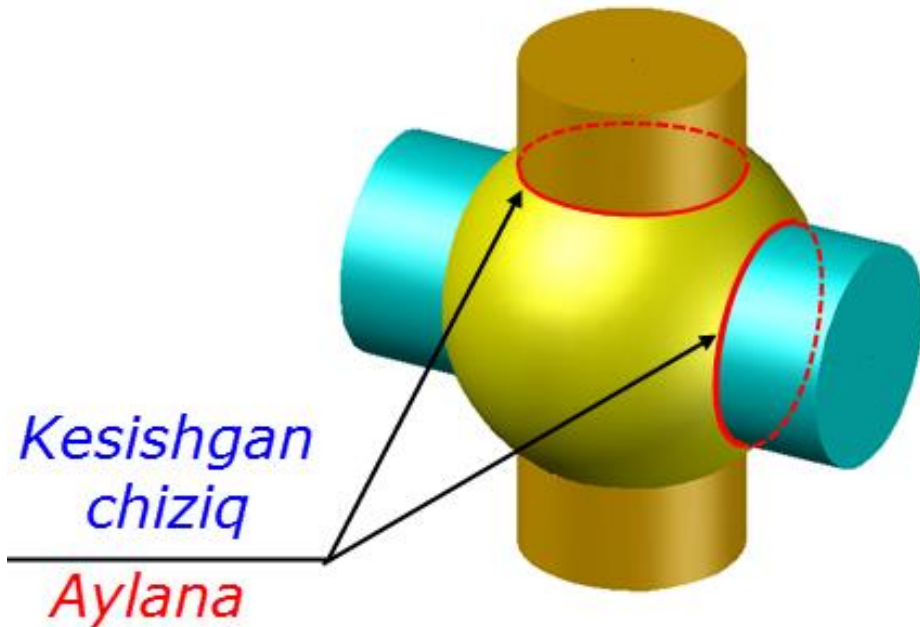
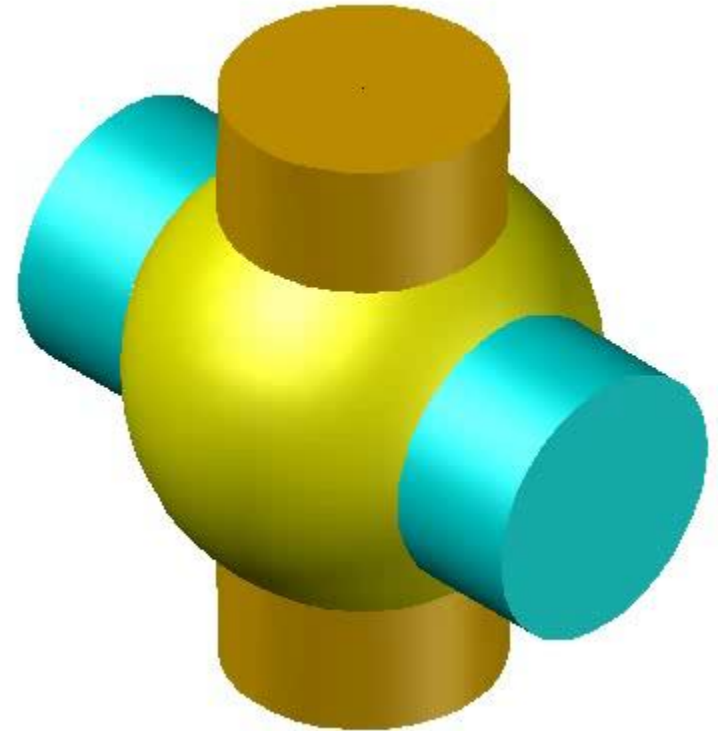
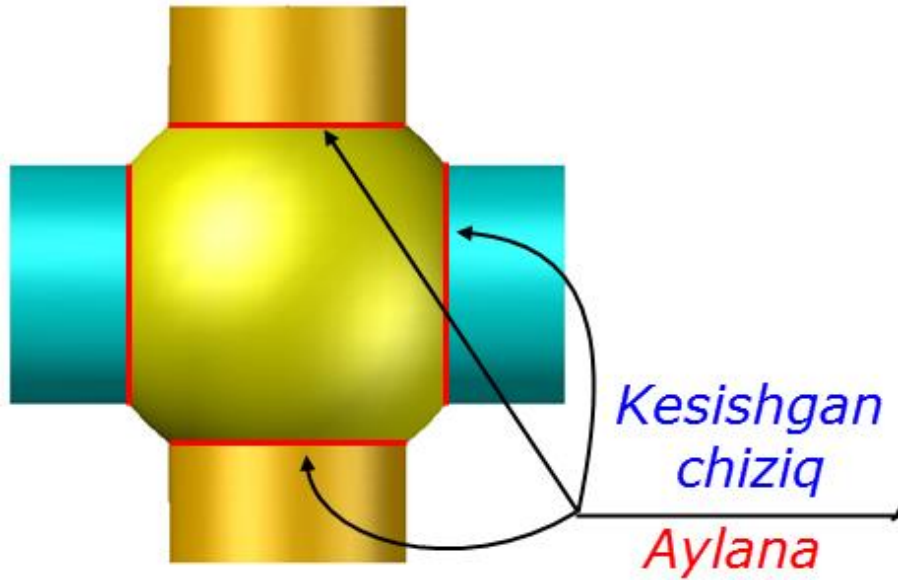


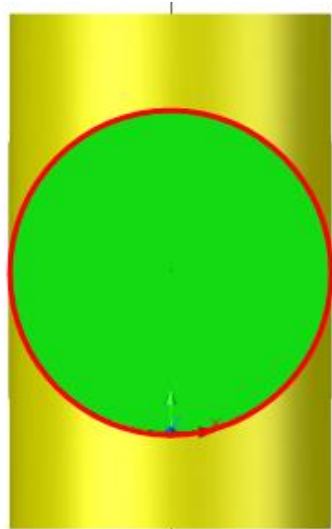
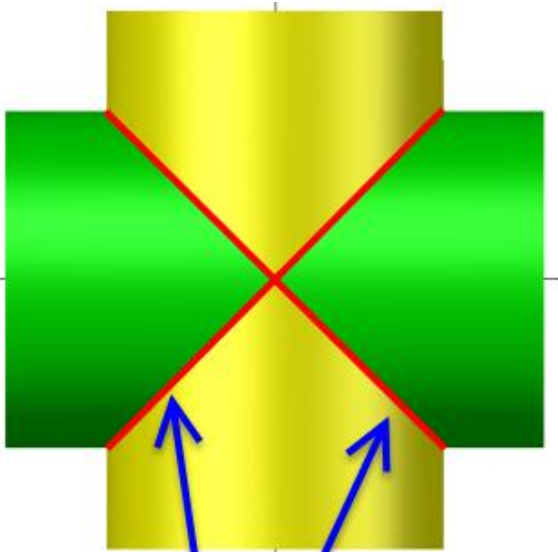
- Oqlari kesishib o‘zaro perpendikulyar bo‘lgan aylanish silindri bilan tor sirti bo‘lagining kesishish chizig‘ini yasash tasvirlangan. Kesishish egri chizig‘ini yasash $H_1(H_{1V}), \dots$ gorizontalkesuvchi tekisliklar o‘tkazish yo‘li bilan yasalgan. Bunday holda sirlarning kesishish egri chizig‘i ikkita simmetrik bo‘lakdan iborat bo‘ladi. 1, 4, 7 xarakterli nuqtalarni yasash H_{1V}, H_{4V} va H_{7V} tekisliklar yordamida yasalgan. Kesishgan egri chiziqning gorizontalkesuvchi proyeksiyasini ko‘rinadigan va ko‘rinmaydigan qismlari H_4 simmetriya tekisligi yordamida aniqlanadi.



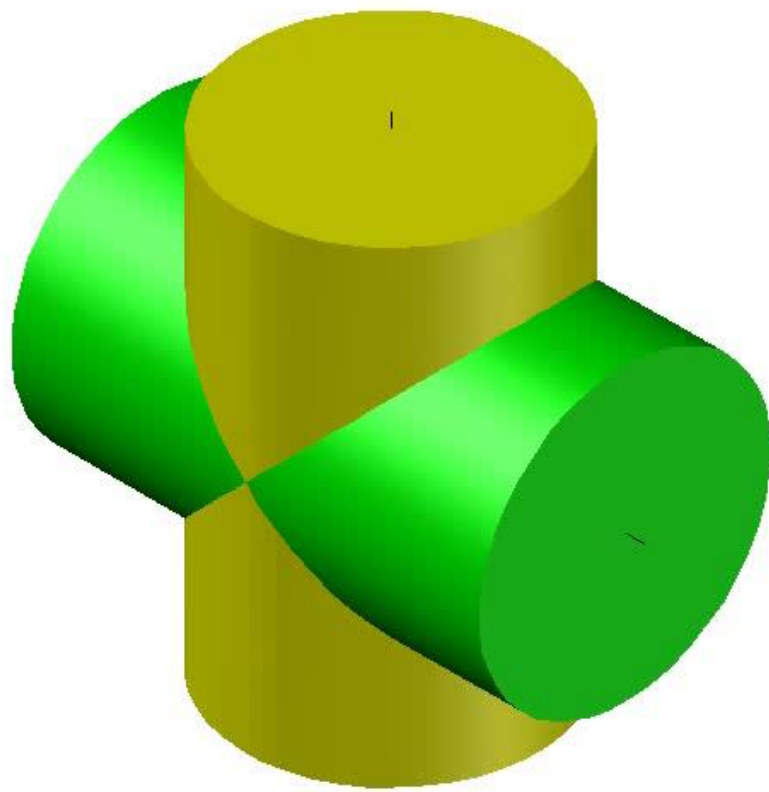
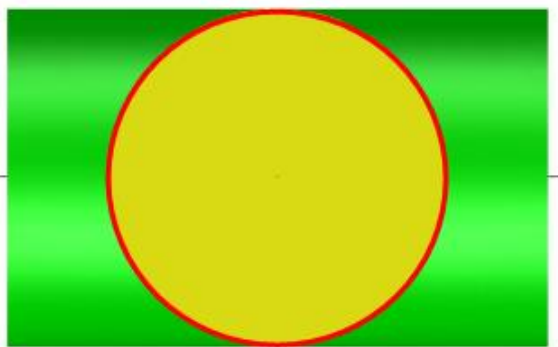


Sharni silindr bilan kesishgan chizig'i





*Kesishgan
chiziq*



O'qlari umumiy nuqtaga ega bo'lgan aylanish sirtlarining o'zaro kesishuvi. Yordamchi kesuvchi sharlar usuli

