Mavzu: KO’PBURChAKLAR

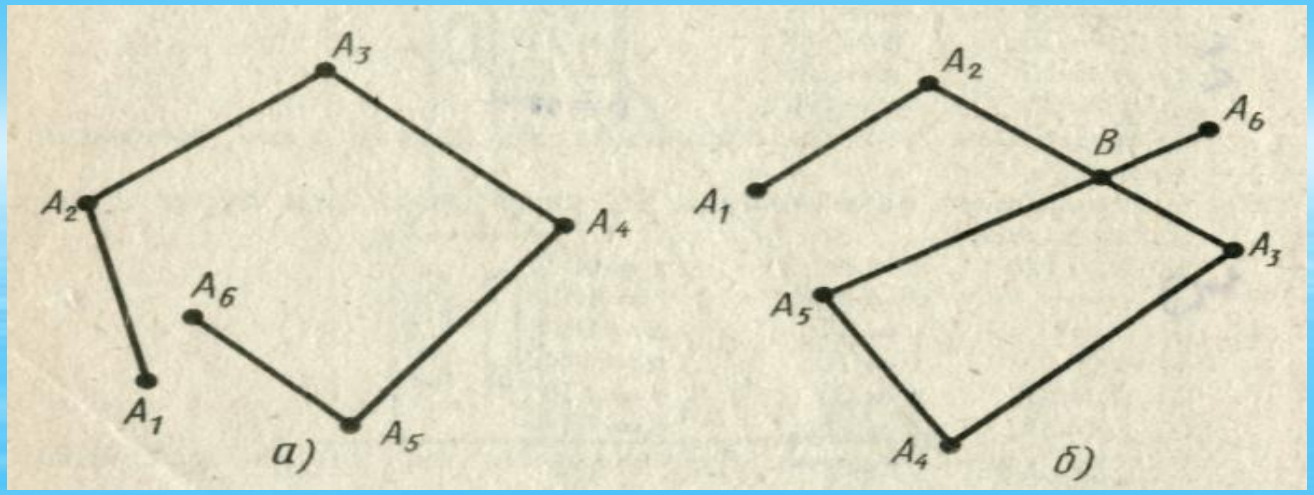
Reja:

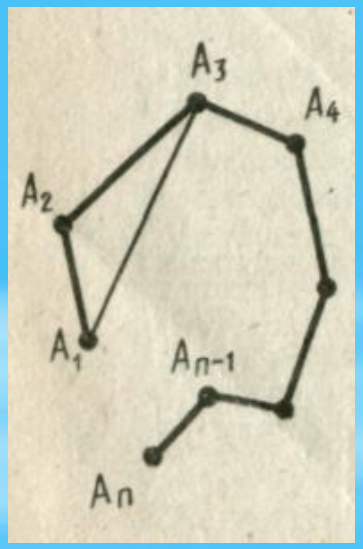
1. **Ko’pburchaklar va siniq chiziq**
2. **Qavariq ko’pburchaklar**
3. **Muntazam ko’pburchaklar**
4. **Muntazam qavariq ko’pburchaklarning o’xshashligi**

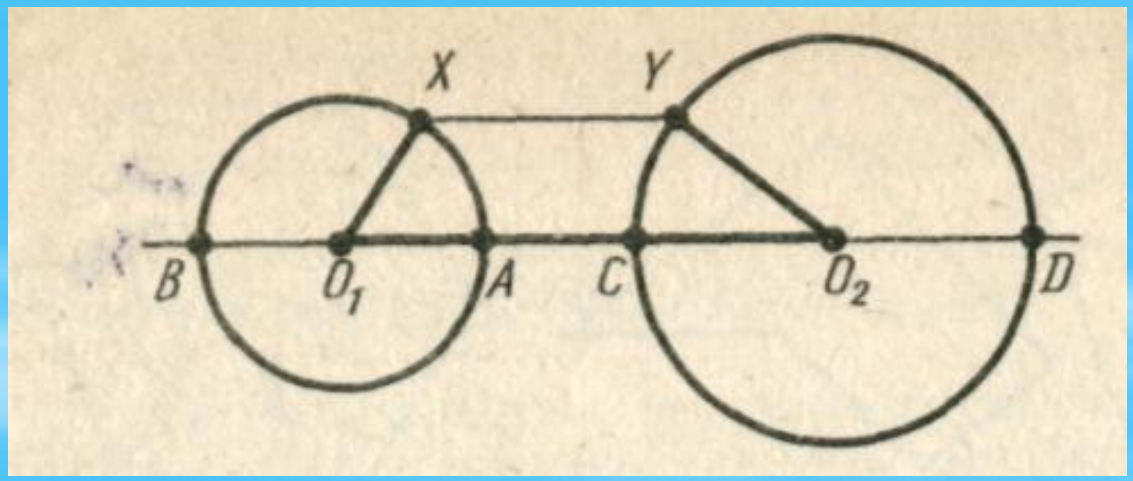
KO’PBURChAKLAR
SINIQ ChIZIQ

A_1 ,A_2 ,...., A_n nuqtalardan va ularni tutashtiruvchi A_1A_2,A_2A_3,…,A_{n-1} A_n kesmalardan iborat figura A_1 A_2 A_3...A_n *siniq, chiziq,* deb ataladi. A_1,A_2,...,A_n nuqtalar siniq chiziqning *uchlari* A_1A_2, A_2A_3,...,$A_{n-1}A_n$ kesmalar esa siniq, chiziqning *bo’g’inlari* deb ataladi. Agar siniq chiziq o’z-o’zi bilan kesishmasa, bunday siniq chiziq *sodda siniq, chiziq*, deyiladi. . 1-*a* rasmda sodda siniq chiziq, 1-b rasmda esa o'z-o'zi bilan kesishadigan *(V* nuqtada) siniq chiziq ko’rsatilgan. Siniq chiziqning xamma bo’g’inlari uzunliklarining yig’indisi shu *siniq, chiziqning uzunligi* deyiladi.

1- t e o r e m a. ***Siniq chiziqning uzunligi uning oxirlarini tutashtiruvchi kesma uzunligidan kichik emas.***

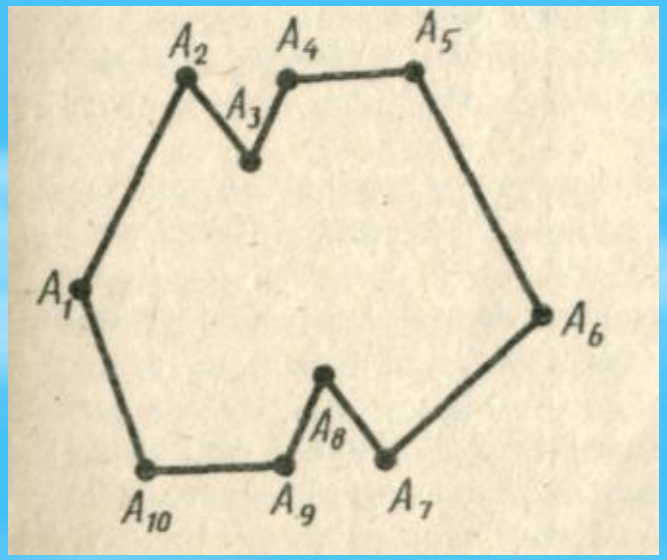

A3
A2
A4
A6
A1
A5
а)
A2
A6
B
A1
A3
A5
A4
б)

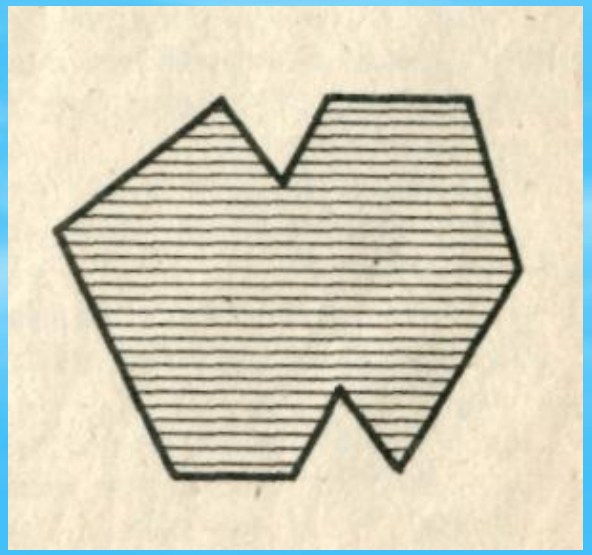

A3
A4
A2
A1
An-1
An

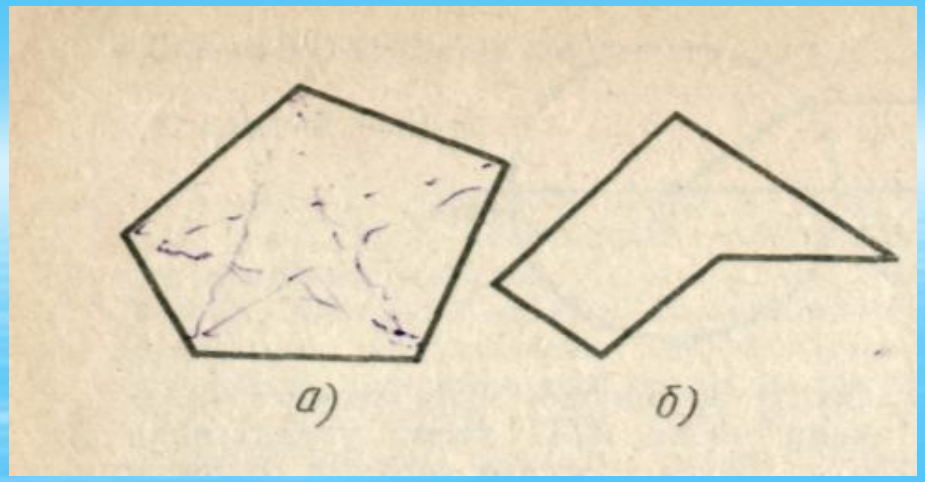

X
Y
B
O1
A
C
O2
D

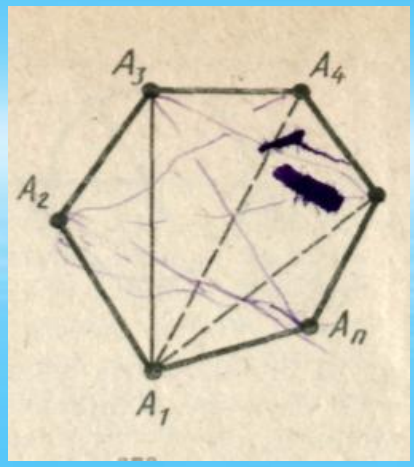
QAVARIQ KO’PBURChAKLAR

Siniq chiziqning oxirlari ustma-ust tushsa, bunday siniq chiziq *yopiq*, deyiladi. Qo’shni bo’g’inlari bir to’g’ri chiziqda yotmagan sodda yopik siniq chiziq *kupburchak* deyiladi (rasm). Siniq chiziqning uchlari *kupburchakning uchlari*, siniq chiziqning bo’g’inlari *kupburchakning tomonlari* deb ataladi.









Ko’pburchakning qo’shni bo’lmagan uchlarini tutashtiruvchi kesmalar *kupburchakning diagonallari* deyiladi. *p* uchli kupburchak va shuning bilan birga *p* tomonli ko’pburchak *p burchak* deb ataladi (turtburchak, beshburchak,.,).

Tekislikning ko’pburchak bilan chegaralangan chekli qismi *yasen kupburchak* yoki *ko’pburchakli soba* deyiladi.

Agar ko’pburchak tomonini o’z ichiga olgan ixtiyoriy to’g’ri chiziqka nisbatan bitta yarim tekislikda yotsa, u *qavarik*, *ko’pburchak* deyiladi. Bunda to’g’ri chiziqning o’zi shu yarim tekislikka tegishli xisoblanadi. 2-*a* rasmda qavarik ko’pburchak, 2-b rasmda esa noqavarik ko’pburchak tasvirlangan. *Ko’pburchakning* berilgan uchidagi *burchagi* deb uning shu uchida uchrashuvchi tomonlari xoeyl kilgan burchakka aytiladi.

2- teorem a. *Qavarik, p burchak burchaklarining yigindi si* 180°(n — 2) *ga teng.*

MUNTAZAM KO’PBURChAKLAR

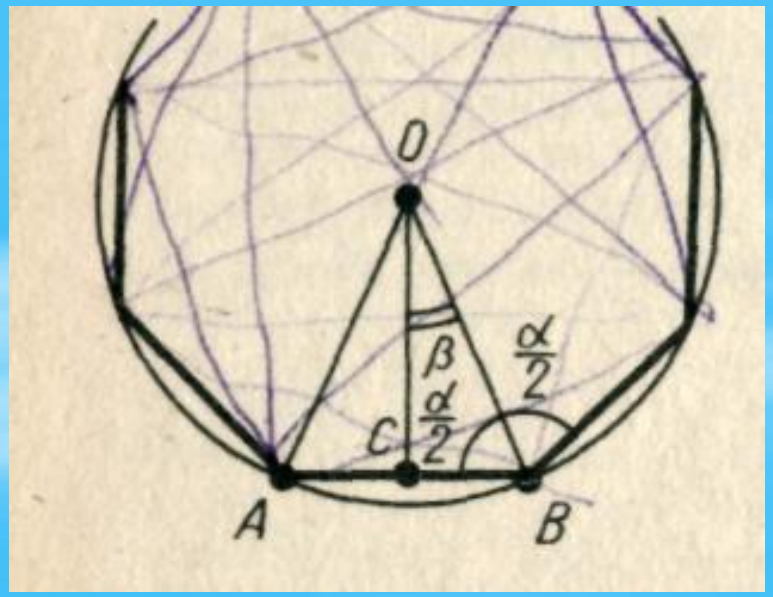
Xamma tomonlari teng va xamma burchaklari teng bo’lgan qavariq ko’pburchak *muntazam ko’pburchak* deyiladi.

Xamma uchlari biror aylanada yotgan ko’pburchak aylanaga *ichki chizilgan ko’pburchak* deyiladi. Xamma tomonlari biror aylanaga uringan ko’pburchak aylanaga *tashqi chizilgan ko’pburchak* deyiladi.

3- teorema**.** ***Muntazam qavariq, ko’pburchak aylanaga ichki chizilgan bo’lishi va aylanaga tashqi chizilgan bo’lishi mumkin.***

MUNTAZAM KO’PBURChAKLARNING ICHKI VA TASHQI ChIZILGAN AYLANALAR RADIUSLARI UChUN FORMULALAR

Tomoni a ga va tomonlarining soni p ga teng bo’lgan muntazam ko’pburchak uchun tashki chizilgan aylananing R radiusini va ichki chizilgan aylananing r radiusini topamiz (3-rasm). Quidagilarga egamiz:



$$\beta = \frac{180^\circ}{n};$$

$$R = OB = \frac{CB}{\sin\beta} = \frac{a}{2\sin\frac{180^\circ}{n}};$$

$$r = OC = \frac{CB}{\operatorname{tg}\beta} = \frac{a}{2\operatorname{tg}\frac{180^\circ}{n}}.$$

Muntazam (teng tomonli) uchburchak uchun

$$R = \frac{a}{2\sin 60^\circ} = \frac{a}{\sqrt{3}};\ r = \frac{a}{2\operatorname{tg} 60^\circ} = \frac{a}{2\sqrt{3}}.$$

Muntazam to'rtburchak kvadrat) uchun

$$R = \frac{a}{2\sin 30^\circ} = a;\ r = \frac{a}{2\operatorname{tg} 30^\circ} = \frac{a\sqrt{3}}{2}.$$

$$n = 4,\ \beta = \frac{180^\circ}{4} = 45^\circ,$$

Muntazam oltiburchak uchun

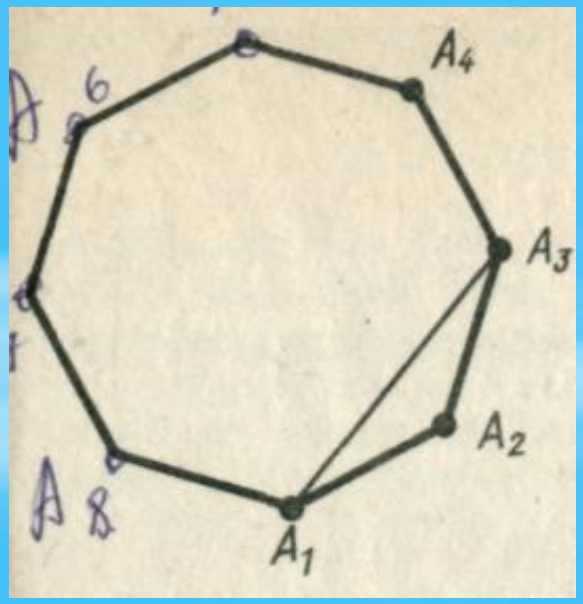
$$n = 6,\ \beta = \frac{180^\circ}{6} = 30^\circ,$$

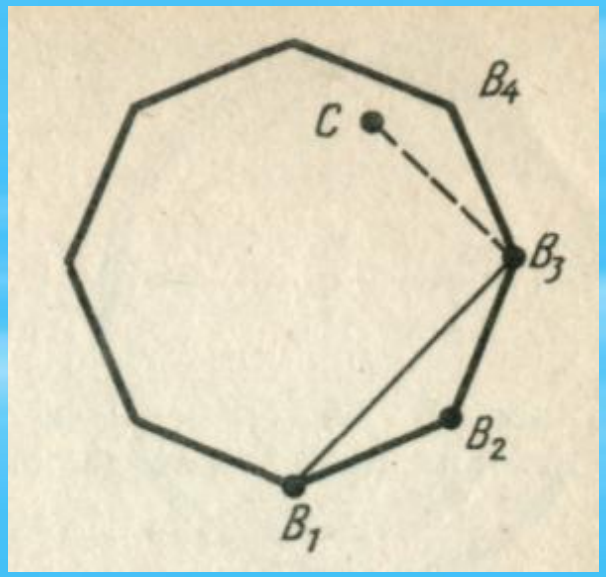
BA’ZI MUNTAZAM KO’PBURChAKLARNI YASASh

Aylanaga ichki chizilgan muntazam kupburchakni yasash uchun uning markaziy burchagini yasash etarli. Muntazam oltiburchak uchun bunday burchak $\frac{360^\circ}{6} = 60^\circ$ a teng. Shu sababli muntazam oltiburchakni yasash uchun uning aylanadagi bir uchini (*A*1 ni) ixtiyoriy olamiz. Undan xuddi markazdan yolgandek aylana radiusiga teng radius bilan aylanadan bitta nuqtani belgilaymiz, bu *A*2 nuqta bo’ladi (4-rasm). Shundan keyin boshqa *A*3 *A*4 *A*5 *A*6 uchlarni shunga o’xshash yasaymiz va ularni kesmalar bilan tutashtiramiz. Muntazam ichki chizilgan uchburchakni yasash uchun muntazam ichki chizilgan oltiburchakning tomonlarini bittadan oralatib birlashtirish etarli.

MUNTAZAM QAVARIQ KO’PBURChAKLARNING O’XShAShLIGI

4-teorema. ***Muntazam qavariq p burchaklar o’xhash. Xususan, agar ularning tomonlari bir xil bo’lsa, ular teng bo’ladi.***





E’tiboringiz

uchun

rahmat