



Agzamaxodjaeva M.Sh

I kurs. GEOMETRIYA

13-Mavzu: UCHBURCHAKNING YUZI



UCHBURCHAKNING YUZI



TIAME

Uchburchak yuzini hisoblash formulasini topish uchun parallelogramm shakliga keltirish usulidan foydalanamiz.

Teorema.

Uchburchakning yuzi uning asosi bilan balandligi ko'paytmasining yarmiga teng:

$$S = \frac{1}{2} a \cdot h .$$

Isbot. ABC – berilgan uchburchak bo'lsin (145- rasm). Bu uchburchakni rasmda ko'rsatilgandek $ABDC$ parallelogrammga to'ldiramiz. ABC va DCB uchburchaklar teng, chunki parallelogrammning diagonali uni teng ikki uchburchakka ajratadi. Va, demak, bu uchburchaklarning yuzlari teng. Shuning uchun $ABDC$ parallelogrammning yuzi ABC uchburchak yuzining ikkilanganiga teng,

ya'ni

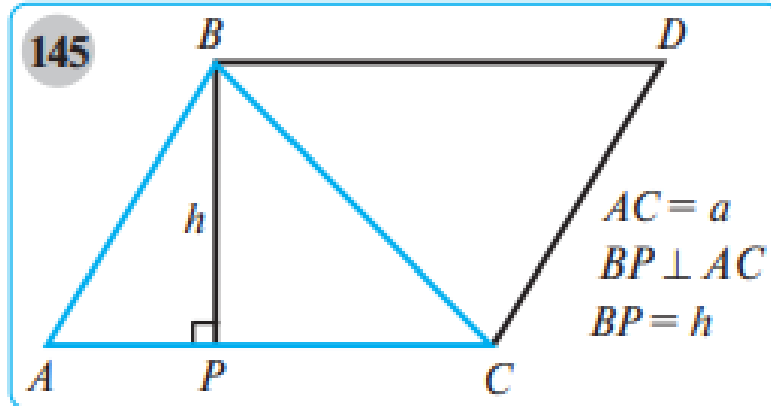
$$2S = a \cdot h.$$

Bundan, $S = \frac{ah}{2}$. Teorema isbotlandi.

Uchburchakning yuzini hisoblash formulasini boshqacha ham o'qish mumkin:

uchburchakning yuzi uning o'rta chizig'i bilan balandligining ko'paytmasiga teng:

$$S = \frac{a}{2} \cdot h.$$





TIAME

1-natija. *To'g'ri burchakli uchburchakning yuzi katetlari ko'paytmasining yarmiga teng, chunki bir katetni asos va ikkinchisini balandlik qilib olish mumkin.*

2-natija. *Ikkita uchburchak yuzlarining nisbati asoslari bilan balandliklari ko'paytmasining nisbati kabidir.*

3-natija. *Asoslari teng bo'lgan ikki uchburchak yuzlarining nisbati balandliklarining nisbati kabidir.*

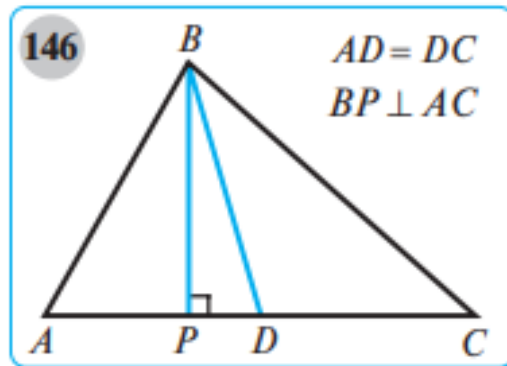
4-natija. *Balandliklari teng bo'lgan ikki uchburchak yuzlarining nisbati asoslarining nisbati kabidir.*

5-natija. *Asoslari va balandliklari teng bo'lgan uchburchaklar tengdoshdir.*

1-masala. Uchburchakning medianasi uni ikkita tengdosh uchburchakka bo'lishini isbot qiling.

Isbot. BD – ABC uchburchakning medianasi bo'lsin (146- rasm). ABD va CBD uchburchaklar teng AD va DC tomonlarga hamda umumiy BP balandlikka ega, ya'ni uchburchaklar 5- natijaga ko'ra tengdoshdir:

$$S_{ABD} = S_{CBD}$$



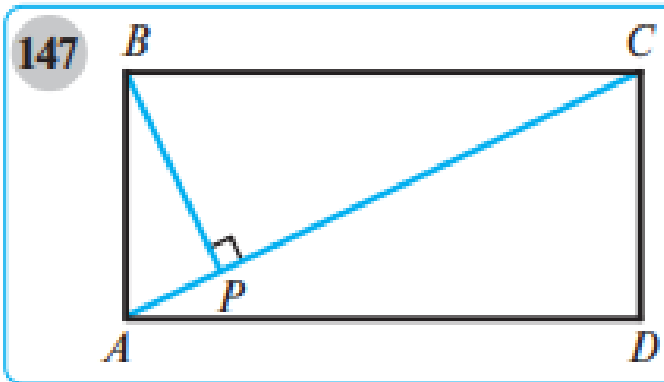
2-masala. Berilgan: $ABCD$ – to'g'ri to'rtburchak, $AC = 20$ sm
 $BP = 12$ sm, $BP \perp AC$ (147- rasm).

Topish kerak: S_{ABCD}

Yechilishi. 1) $S_{ABC} = 0,5AC \cdot BP = 0,5 \cdot 20 \cdot 12 = 120$ (sm²).

2) $S_{ABCD} = 2 \cdot S_{ABC} = 2 \cdot 120 = 240$ (sm²).

Javob: $S_{ABCD} = 240$ sm².





Ma'lumki, uchburchakning yuzi uning asosi bilan balandligi ko'paytmasining yarmiga teng:

$$S = \frac{1}{2} a \cdot h_a = \frac{1}{2} b \cdot h_b = \frac{1}{2} c \cdot h_c .$$

Balandlik o'rniga uning uchburchak tomonlari orqali ifodasini qo'yib, uni soddalashtirib ushbu formulani hosil qilamiz:

$$S = \sqrt{p(p-a)(p-b)(p-c)} .$$

Bu formula milodning I asrida yashagan qadimgi yunon olimi iskandariyalik **Geron** tomonidan topilgan bo'lib, u *Geron formulasi* deb ataladi.

Geron formulasi uchburchakning uchala tomoni uzunligi ma'lum bo'lganda uning yuzini hisoblash uchun ishlatiladi.