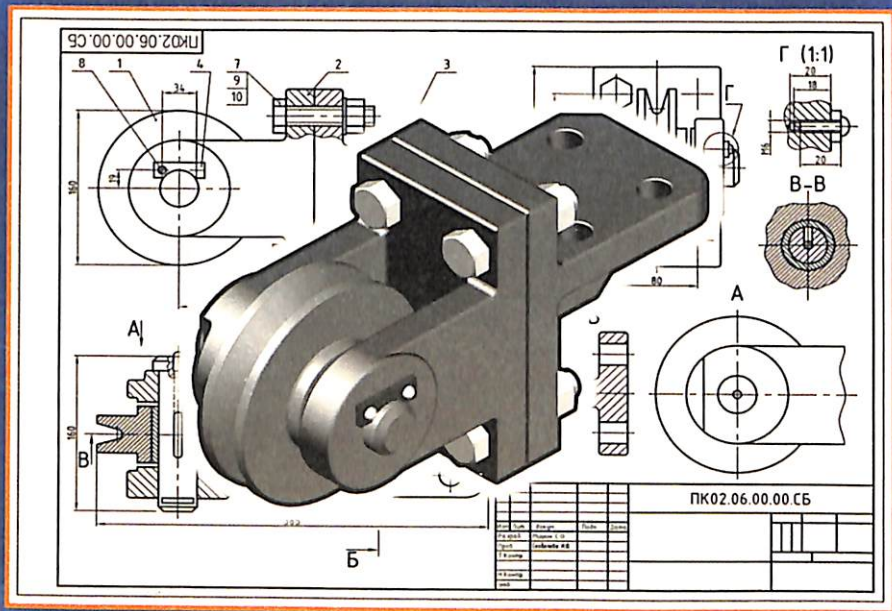


# CHIZMACHILIK

**(topshiriqlar to'plami)**



O'ZBEKISTON RESPUBLIKASI OLIY VA O'RTA MAXSUS  
TA'LIM VAZIRLIGI

O'RTA MAXSUS, KASB-HUNAR TA'LIMI MARKAZI

E.I. RO'ZIYEV, R.A. LATIPOV

# CHIZMACHILIK (TOPSHIRIQLAR TO'PLAMI)

*Kasb-hunar kollejlari uchun o'quv qo'llanma*



Toshkent — «ILM ZIYO» — 2017



*Oliy va o'rta maxsus, kasb-hunar ta'limi ilmiy-metodik  
birlashmalari faoliyatini muvofiqlashtiruvchi Kengash  
tomonidan nashrga tavsiya etilgan.*

O'quv qo'llanmada kasb-hunar kollejlari o'quvchilari uchun chizmachilik fani bo'yicha grafik topshiriqlar variantlari keltirilgan. Topshiriqlar chizmachilik fanining asosiy mavzulari bo'yicha tuzilgan bo'lib, ta'lim mazmunining majburiy minimumiga to'la mos keladi.

Ushbu qo'llanmada chizmachilik fanining asosiy vazifalaridan bo'lgan — texnika ta'limi yo'nalishini kuchaytirish, grafik tasvirlarning rivojlanishi va zamonaviy grafikada milliylik komponentlari bilan tanishtirish maqsadida ilk bora o'quvchilarning konstruksiyalash va ijodkorlik qobiliyatlarini rivojlantirishga yo'naltirilgan topshiriqlar variantlari alohida bo'limlar sifatida kiritildi. Bu bo'limlar materiallaridan fan o'qituvchilari chizmachilikdan olimpiada topshiriqlarini tuzishda, shuningdek, fakultativ va to'garak mashg'ulotlarida ham samarali foydalanishlari mumkin.

Qo'llanmadagi topshiriqlar variantlari chizmachilik fanining asosiy mavzulari bo'yicha yaratilgan bo'lib, har bir mavzuga tegishli topshiriqlar, asosan, 12 variantda tuzilgan. Topshiriqlar chizmachilikdan kasb-hunar kollejlariidagi namunaviy o'quv dasturi hamda amalda qo'llanilayotgan darsliklarga to'la mos keladi. Amaliy va grafik ishlarning joylashish ketma-ketligi ham dastur va darslikka mos keladi.

*Pedagogika fanlari doktori, professor E.I.Ro'ziyevning  
umumiy tahriri ostida*

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## KIRISH

Chizmachilik fani o'quvchilarning politexnik ta'limida kuchli vosita hisoblanadi. Chizmalarni o'z qo'li bilan yuqori sifatda bajarishga hamma o'quvchini o'rgatish mumkin, bu ularda go'zallik tuyg'ularini uyg'otib, o'z ishidan qoniqish hisini hosil qiladi. O'z qo'li bilan sifatli chizmalar bajarish o'quvchilarda ozodalik, mehnat-sevarlik, intizomlilik va tartiblilik xususiyatlarini rivojlantiradi.

Grafikaning hayotning hamma sohalarida turli ko'rinishlarda keng qo'llanilayotganiga juda ko'plab misollarni keltirish mumkin. Demak, har qanday inson qaysi kasb egasi bo'lishidan qat'i nazar ma'lum bir grafik bilimlarni o'rganib, ularni amalda qo'llay olish ko'nikmalarini egallagan bo'lishi kerak. Kasbi bevosita muhandislik yoki badiiy grafika faoliyati bilan bog'liq bo'lmagan har bir kishining grafik savodxonligini texnik chizmachilikning amaliy foydali bo'lgan mavzulari: «Ko'rinishlar, qirqimlar, kesimlar», «Eskizlar», «Yig'ish chizmalari», «Yoyilmalarni qurish», «Aksonometrik proyeksiya va texnik rasm» mavzularidan turmushda foydalana olishini belgilaydi.

Kishining grafik madaniyati uning umumiy grafik savodxonligi, «Perspektiva» bo'limi va badiiy grafika (rasm solish) bilan tanishligi, kompyuter grafikasi asoslarini bilishi hamda grafika tarixining umumiy masalalari va uning hozirgi ahvoli haqida tushunchalarga egaligi bilan baholanadi. Grafik savodxonlik kishilarda obrazli va mantiqiy fikrlash qobiliyatlarini rivojlantiradi.

Jamiyat a'zolarining grafik madaniyati darajasi jamiyatning texnik rivojlanganlik darajasiga bog'liqligi aniqlangan. Shuning uchun ham O'zbekiston hududida maktablarda ta'lim tizimi shakllana boshlagan davrdanoq o'quvchilarga chizmachilik asoslari o'rgatila boshlangan. O'zbekiston grafik madaniyati tarixiga nazar tashlaydigan bo'lsak, tarixiy arxitektura obidalari, xalq amaliy san'ati va hunarmandchiligi namunalariidagi tasvirlar bu yerda grafik madaniyat qadimdan yuqori darajada rivojlanganligini isbotlaydi. So'nggi mingyillikdagi geometrik va o'simliksimon naqshlarning yetakchi o'ringa chiqishida islom dinining taqiqlari va chegaralashlari sabab bo'lgan bo'lsa ham, ularda xalq badiiy ijodiyoti namunalari, hunarmandchilik, qurilish ishlari va amaliy fanlarning yuksak yutuqlari namoyon bo'lgan.



Chizmachilikdan mustaqil grafik topshiriqlar va metodik ko'rsatmalar yangi dastur asosida tayyorlandi.

Ushbu qo'llanma kasb-hunar kollejlari o'quvchilari va o'qituvchilar uchun mo'ljallangan bo'lib, 26 turdagi mustaqil grafik topshiriqlardan iborat. Har bir grafik topshiriq 8-12 ta variantda tuzilgan. Bu grafik topshiriqlar o'qituvchiga o'quvchilarni fan olimpiadalariga tayyorlash va dars davomida foydalanishi uchun yordam tariqasida tayyorlandi. Har bir darsda grafik topshiriqlardan imkoni boricha ko'proq foydalanish tavsiya etiladi.

Qo'llanmada grafik topshiriqlarni bajarishga doir metodik ko'rsatmalar berildi.

O'qituvchining diqqat markazida hamisha o'quvchilarda amaliy grafik ish bajarish malakalarini shakllantirish asosiy vazifa ekanligi turishi kerak.

O'quvchilarning chizmachilikdan egallagan nazariy bilimlarini mustahkamlash maqsadida har bir o'quvchiga individual grafik topshiriqlar beriladi. O'qituvchi o'quvchilarning mustaqil ishiga alohida e'tibor berishi, ularga chizmalarni o'qish va bajarish kabi masalalarni mustaqil hal qilish malakalarini singdirmog'i lozim. Agar o'quvchi grafik topshiriqni bajarishda qiynalsa yoki uni tushunolmay qolsa, u holda unga oqilona yordam berish kerak.

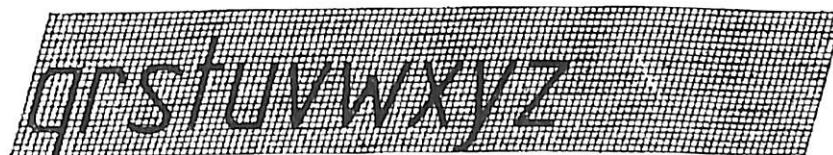
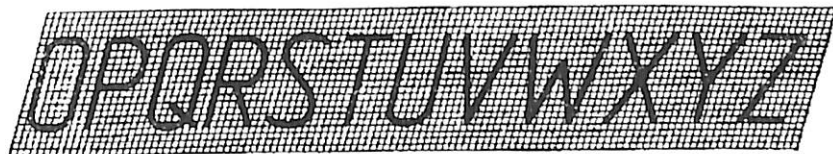
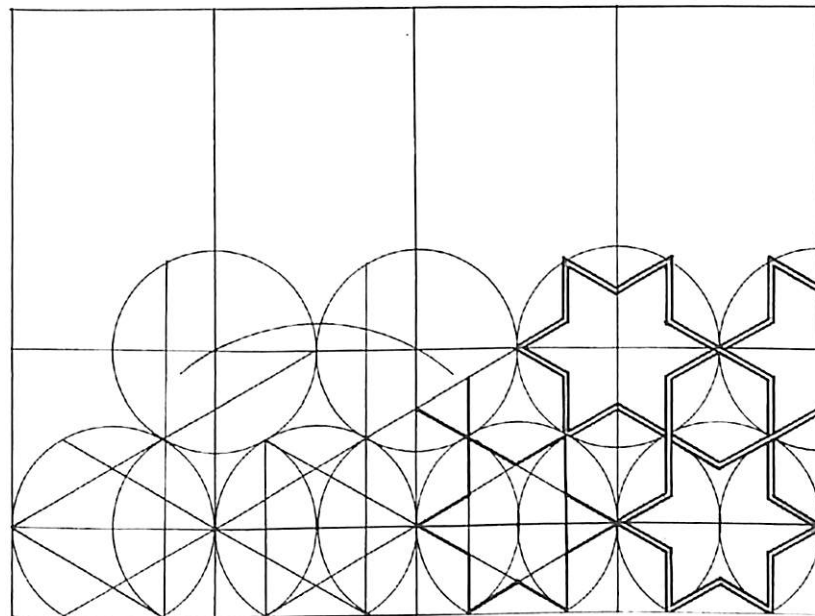
Har bir o'quvchining individual xususiyatlarini namoyon qilishga ko'maklashadigan mustaqil ishlarni to'g'ri tashkil qilish bevosita o'qituvchining mahoratiga bog'liq. Mustaqil ishlarda o'quvchilarning individual xususiyatlari yorqin namoyon bo'ladi, o'qish jarayonida yo'l qo'yilgan kamchiliklarni to'g'rilash imkoniyati ham katta.

Mustaqil ishlarni individuallashtirishda o'quvchi uchun uning qiziqishlarini hisobga olib topshiriq tanlash imkoniyatini yaratish katta ahamiyatga ega. Bunda topshiriq hajmi va mazmuni deyarli o'zgarmasa-da, o'quvchida taklif qilingan topshiriqni bajarishga qiziqishi va istakning keskin ortishiga erishiladi.

Yaxshi grafik tayyorgarlikka ega bo'lgan, chizma va shakllarni savodli bajara oladigan har qanday ishchi ham, mutaxassis ham hamma joyda qadrlanadi. Sizga o'z grafik savodxonligingizni takomillashtirishda muvaffaqiyatlar tilaymiz!

*Mualliflar.*

## I QISM. CHIZMALARNI GRAFIK TEXT QILISH





**1-topshiriq. Chiziq turlari**

O'zDSt 2.301-97 da belgilangan chiziqlarning turlariga rioya qilgan holda A4 formatli chizmachilik qog'ozida ko'rsatilgan variant chizmasini ko'chirib chizing.

Chizma bajarishda chiziqlar orasidagi masofalar hamda shakllarning o'lchamlari ixtiyoriy tanlanadi. Chizma bichimi hoshiyasi chizilib, asosiy yozuv to'ldiriladi. Chizmachilik qog'ozining taxminan 2/3 qismi chizma bilan band bo'lishiga harakat qiling.

Bu topshiriqni bajarishda asosiy e'tiborni turli xil chiziqlarni to'g'ri chizishga qaratish kerak. O'quvchilar chiziq turlarining o'zaro vaziyatini saqlagan holda, ular orasidagi masofalarni o'zgartirishlari mumkin. Chizma bajarishga kirishishdan oldin quyidagi savollarga javob berish so'raladi. Bu orqali nazariy ma'lumotlar takrorlanib, ishni bajarish osonlashadi.

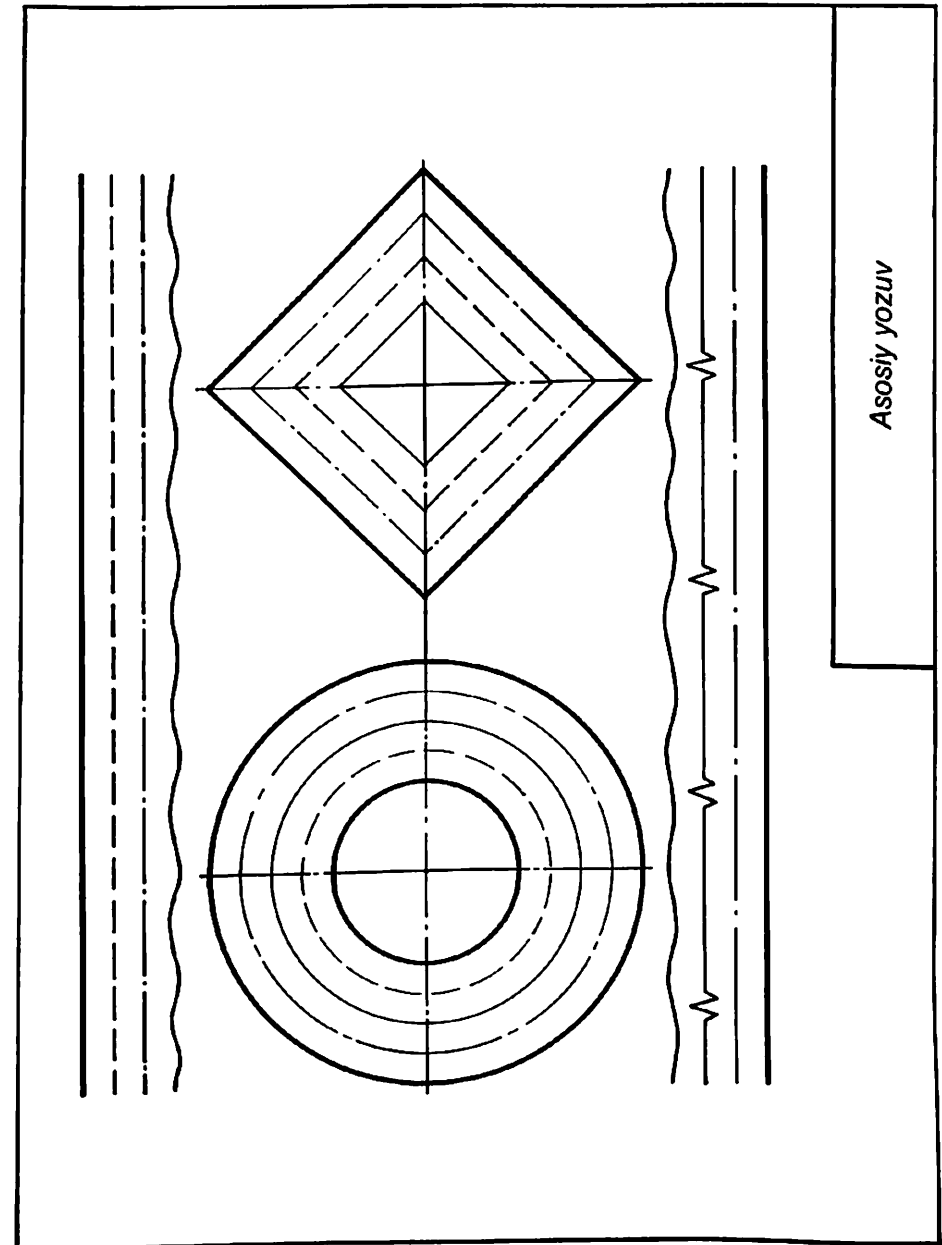
1. Tasvirda qanday chiziq turlari tasvirlangan?
2. Shtrix va shtrix-punktir chiziqlar shtrixlarining uzunligi qanday o'lchamda bo'ladi?
3. Aylana markazi qanday chiziqlarning kesishish markazida yotadi?

**2-topshiriq. Chizma shriftlari va chizmalarga o'lcham qo'yish qoidalari**

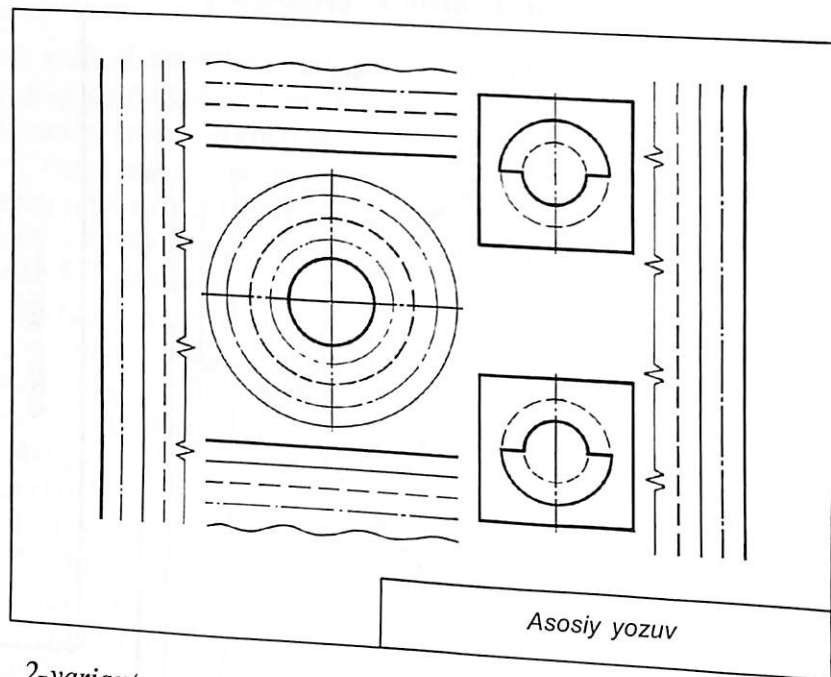
Topshiriq yassi detal chizmasi hamda bir nechta shrift yozuvlarini bajarishdan iborat. O'qituvchi ko'rsatmasi bo'yicha shrift yozuvlaridan faqat ikkitasini (№5 va №10 o'lchamdagilari) bajarish ham mumkin. Bu topshiriqni bajarishda chiqarish va o'lcham chiziqlarini to'g'ri o'tkazishga hamda o'lchamlarni to'g'ri, standart talablari bo'yicha qo'yishga asosiy e'tiborni qaratish zarur.

O'quvchilar chizmalarni taxt qilish qoidalarini puxta o'zlash-tirishlariga erishish maqsadida quyidagiga o'xshash savollar yordamida ularning nazariy bilimlarini tekshirish tavsiya qilinadi:

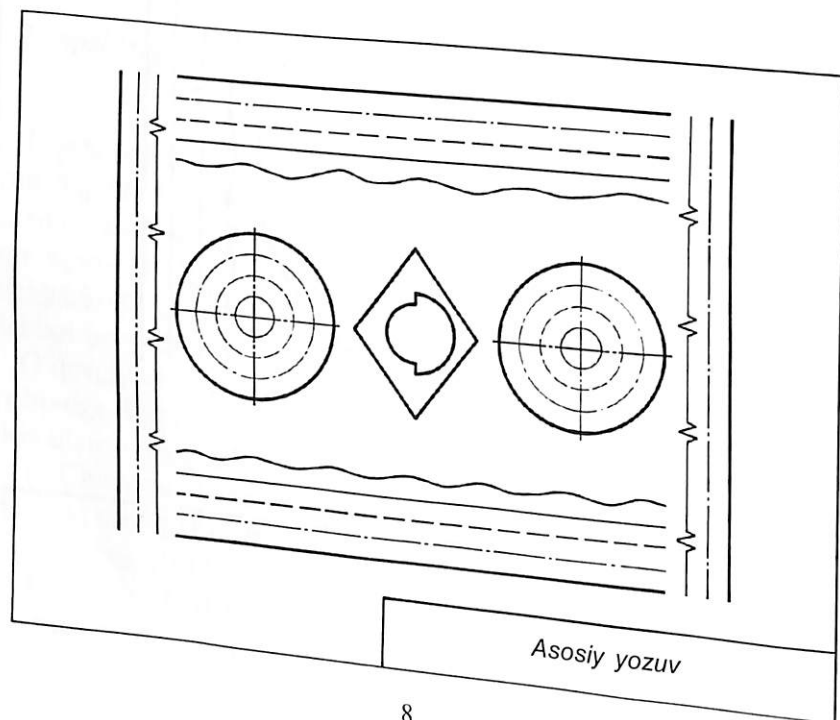
1. Chizmani bajarishda qanday chiziqlardan foydalanilgan? Ularning qalinliklari qanday?
2. Chizmada chiqarish va o'lcham chiziqlari qanday o'tkaziladi?
3. Chizmada diametr va radiuslarni ko'rsatishda o'lcham sonlarining oldiga qanday belgi va harflar qo'yiladi?



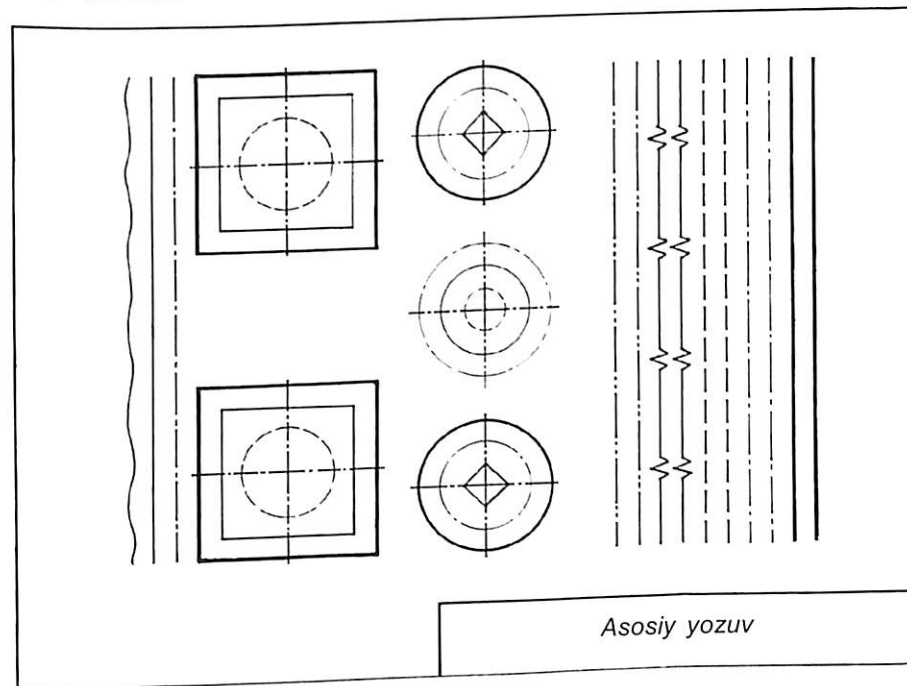
1-variant



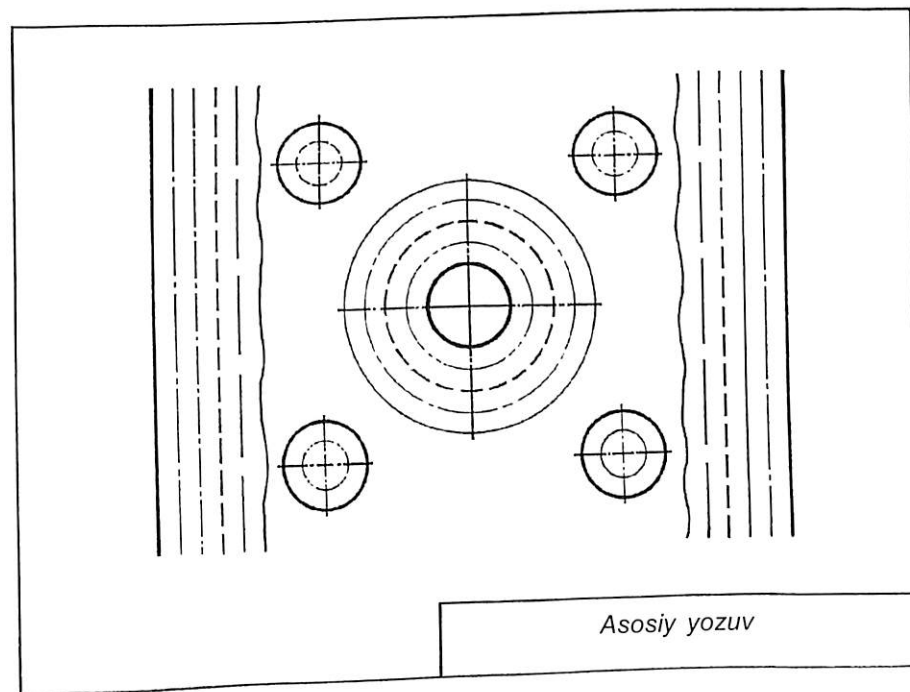
2-variant



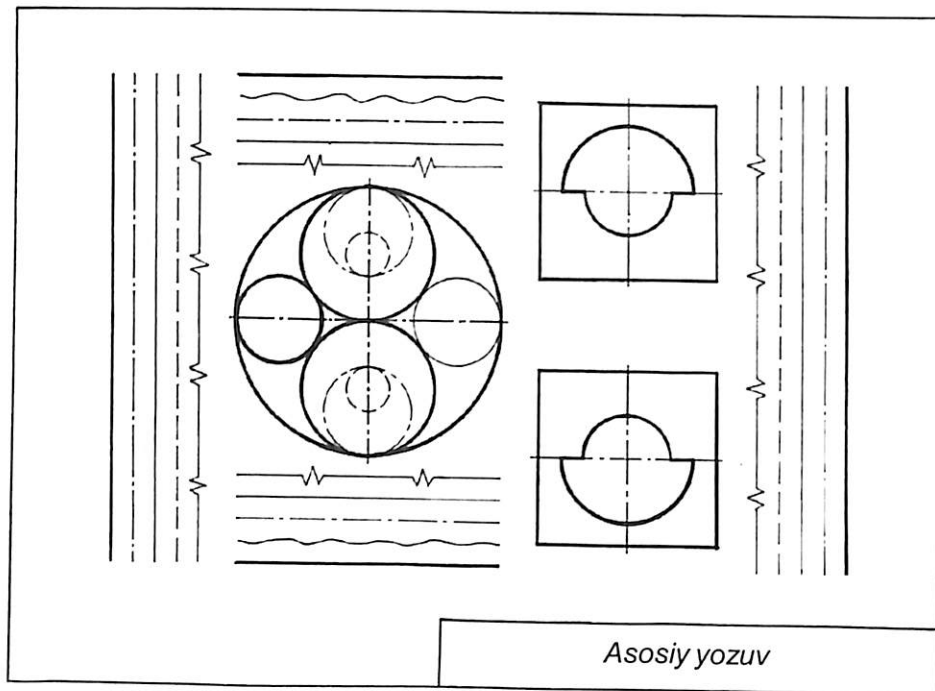
3-variant



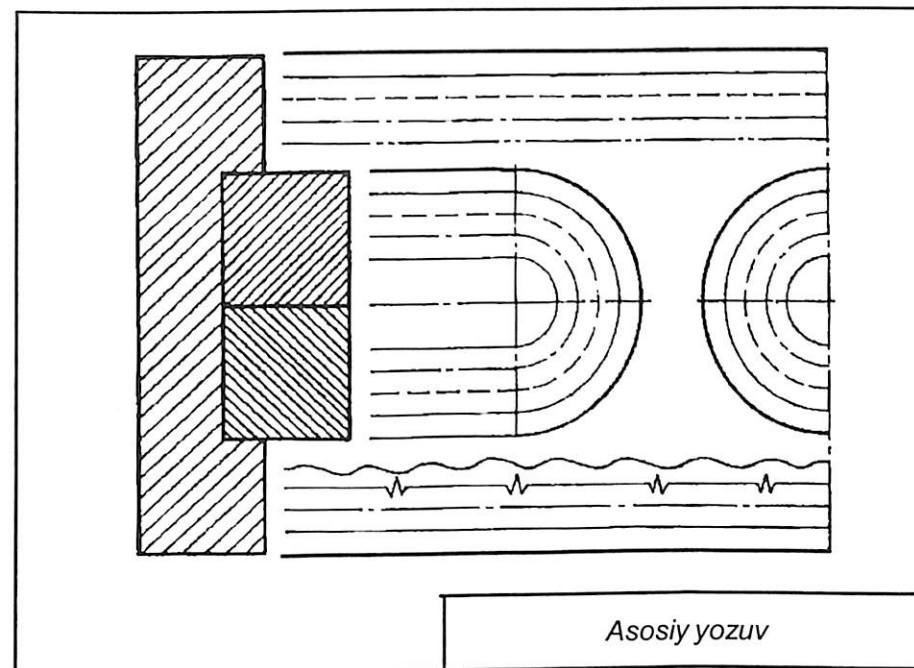
4-variant



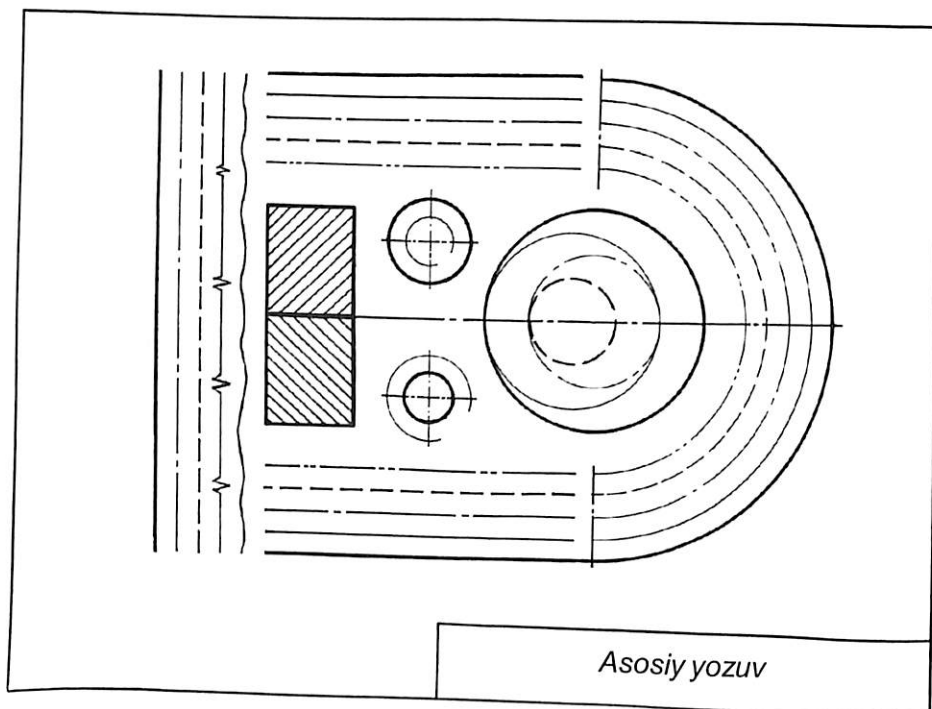
5-variant



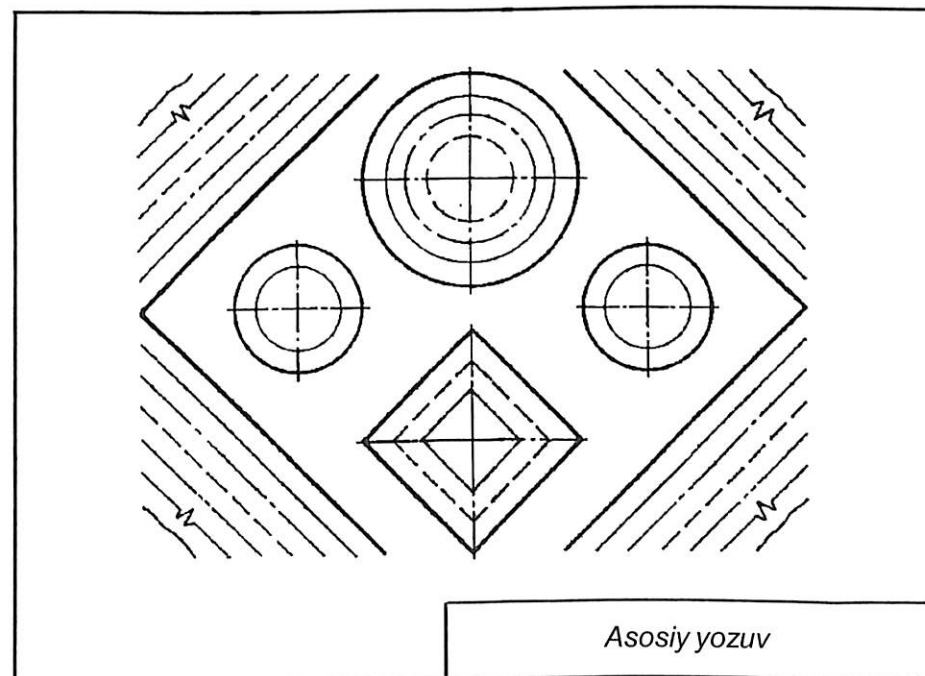
7-variant



6-variant

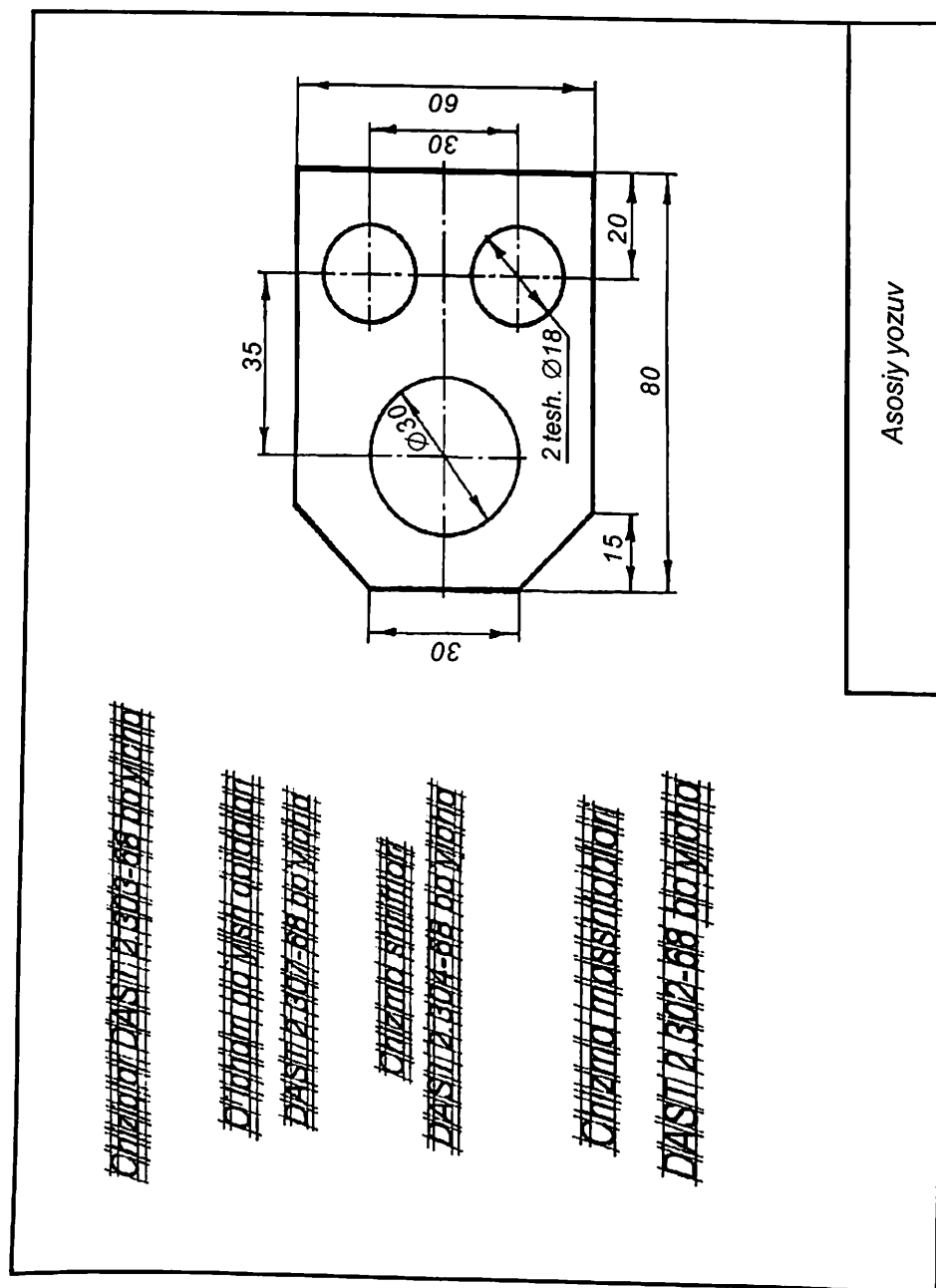


8-variant



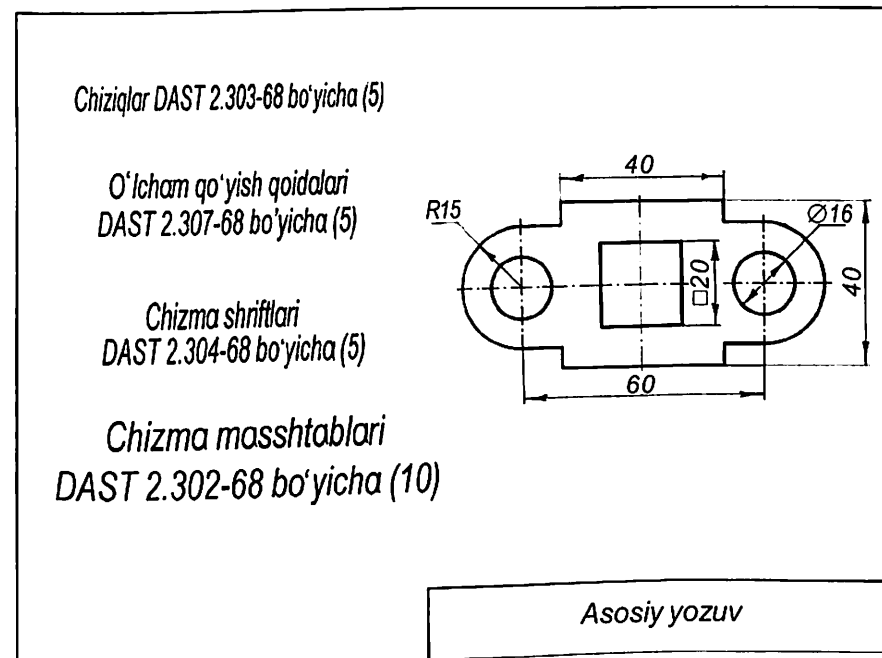


**2-topshiriq — «Chizma shriftlari va chizmalarga o'lcham qo'yish qoidalari»ga namuna**

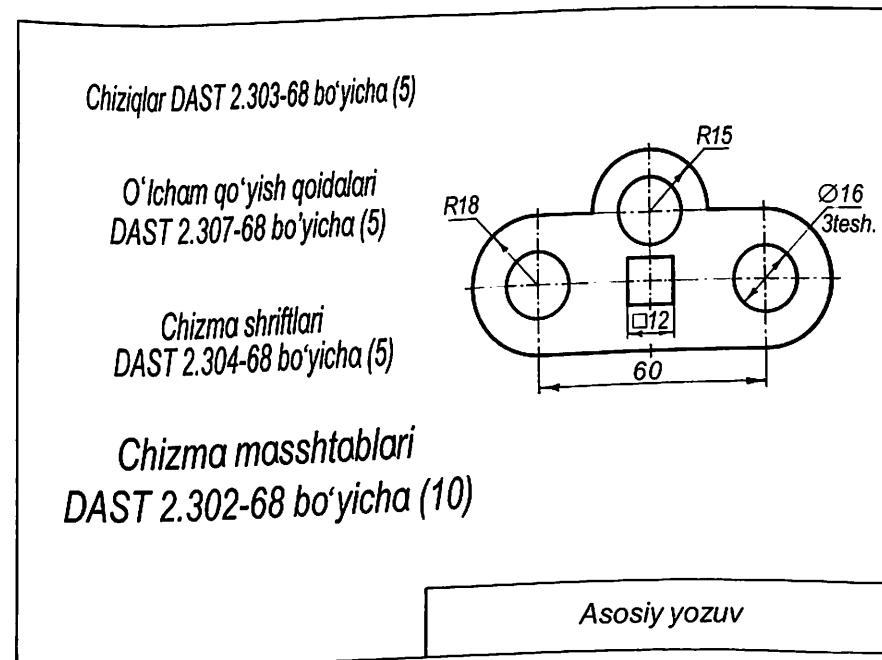


**2-topshiriq variantlari**

**1-variant**



**2-variant**



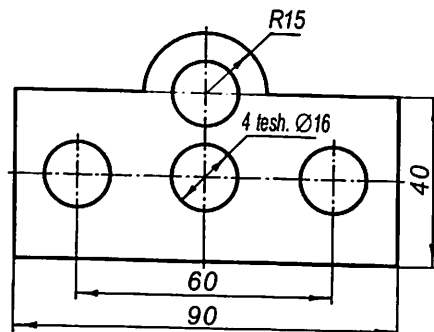
### 3-variant

Chiziqlar DAST 2.303-68 bo'yicha (5)

O'lcham qo'yish qoidalar  
DAST 2.307-68 bo'yicha (5)

Chizma shriftlari  
DAST 2.304-68 bo'yicha (5)

Chizma masshtablari  
DAST 2.302-68 bo'yicha (10)



Asosiy yozuv

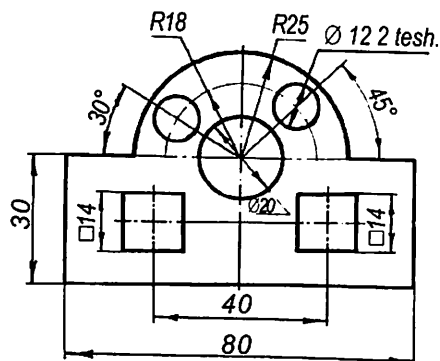
### 4-variant

Chiziqlar DAST 2.303-68 bo'yicha (5)

O'lcham qo'yish qoidalar  
DAST 2.307-68 bo'yicha (5)

Chizma shriftlari  
DAST 2.304-68 bo'yicha (5)

Chizma masshtablari  
DAST 2.302-68 bo'yicha (10)



Asosiy yozuv

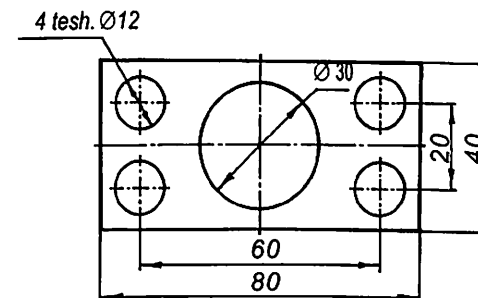
### 5-variant

Chiziqlar DAST 2.303-68 bo'yicha (5)

O'lcham qo'yish qoidalar  
DAST 2.307-68 bo'yicha (5)

Chizma shriftlari  
DAST 2.304-68 bo'yicha (5)

Chizma masshtablari  
DAST 2.302-68 bo'yicha (10)



Asosiy yozuv

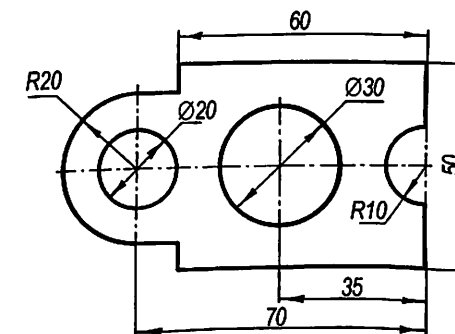
### 6-variant

Chiziqlar DAST 2.303-68 bo'yicha (5)

O'lcham qo'yish qoidalar  
DAST 2.307-68 bo'yicha (5)

Chizma shriftlari  
DAST 2.304-68 bo'yicha (5)

Chizma masshtablari  
DAST 2.302-68 bo'yicha (10)



Asosiy yozuv

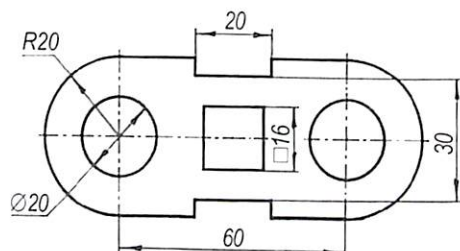
7-variant

Chiziqlar DAST 2.303-68 bo'yicha (5)

O'lcham qo'yish qoidalari  
DAST 2.307-68 bo'yicha (5)

Chizma shriftlari  
DAST 2.304-68 bo'yicha (5)

Chizma masshtablari  
DAST 2.302-68 bo'yicha (10)



Asosiy yozuv

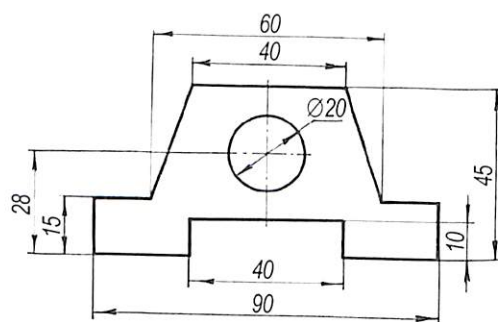
8-variant

Chiziqlar DAST 2.303-68 bo'yicha (5)

O'lcham qo'yish qoidalari  
DAST 2.307-68 bo'yicha (5)

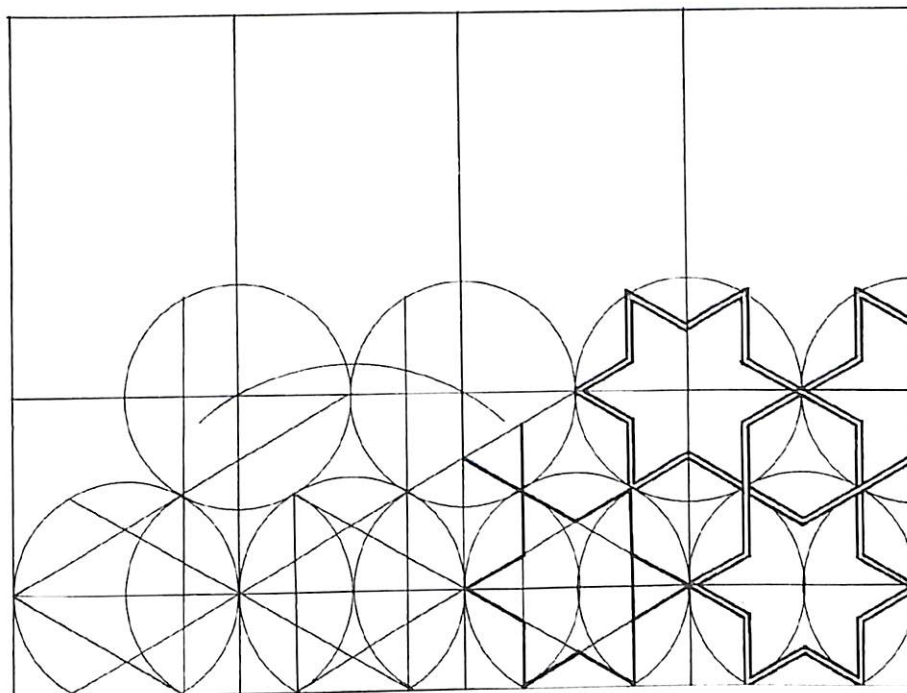
Chizma shriftlari  
DAST 2.304-68 bo'yicha (5)

Chizma masshtablari  
DAST 2.302-68 bo'yicha (10)



Asosiy yozuv

## II QISM. GEOMETRIK CHIZMACHILIK



TERMIZ MUHANDISLIK-  
TEKNOLOGIYA INSTITUTI  
AXBOROT-RESURSLAR MARKAZI

INV. № 1573

28.06.2022 yil

ISLON KARIMOV NOMIDAGI TOSHKENT DAVLAT  
TEKNIKA UNIVERSITETI TERMIZ FILIALI  
AXBOROT-RESURSLAR MARKAZI  
INV. № 1573

12.10.2022 yil

TERMIZ TRAMPOLIN  
KORSATISH KASB-  
HUNAR KOLLEGI  
AXBOROT-RESURSLAR MARKAZI

### 3–5-topshiriqlarning qisqacha bayoni

#### 3-topshiriq. Geometrik yasashlar. Aylanani teng bo'laklarga bo'lish

Mashina va qurilmalarning ayrim detallari aylana bo'ylab tekis joylashgan elementlarga ega bo'ladi. Bunday detallarning chizmalarini bajarishda aylanani teng bo'laklarga bo'lish qoidalarini bilish zarur bo'ladi.

Ushbu topshiriq o'quvchilarni geometrik yasashlarni to'g'ri bajarishga o'rgatish bilan birgalikda, chizmalarni standart talablari bo'yicha bajarish ko'nikmalarini mustahkamlash va ularning estetik didlarini rivojlantirishga yo'naltirilgan.

Topshiriqni bajarishda o'quvchilarning aylanalarni teng bo'laklarga bo'lish qoidalarini o'zlashtirganliklari, chiziqli turlariga rioya qilishlari va standart yozuvlarini to'g'ri bajarishlariga alohida e'tibor qaratish kerak.

#### 4-topshiriq. Tutashmalar

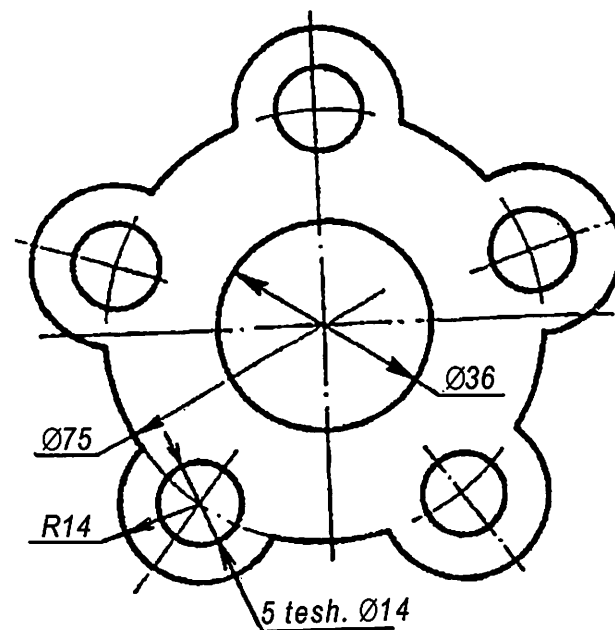
Topshiriq ikkita murakkablikdagi variantda tuzilgan bo'lib, birinchi turdagi topshiriqlar sodda shakldagi tutashmalardan iborat. Ikkinchi turdagi topshiriqlar turmushda uchraydigan uy-ro'zg'or buyumlari va shunga o'xshash mahsulotlar shakli bo'yicha tayyorlangan bo'lib, mavzuni yaxshi o'zlashtirgan o'quvchilarga berishda foydalanish mumkin. Shuningdek, ulardan o'quvchilar oliy ta'lim muassasalariga kirishda ijodiy imtihonlarga tayyorlanishlarida foydalanishlari mumkin.

#### 5-topshiriq. Qiyalik va konusliklar

Bir to'g'ri chiziqlining ikkinchisiga nisbatan og'ish kattaligiga qiyalik deyiladi (topshiriq namunasidagi 1-shakl). Qiyaliklar kasrlar yoki foizlar orqali ifodalanadi.

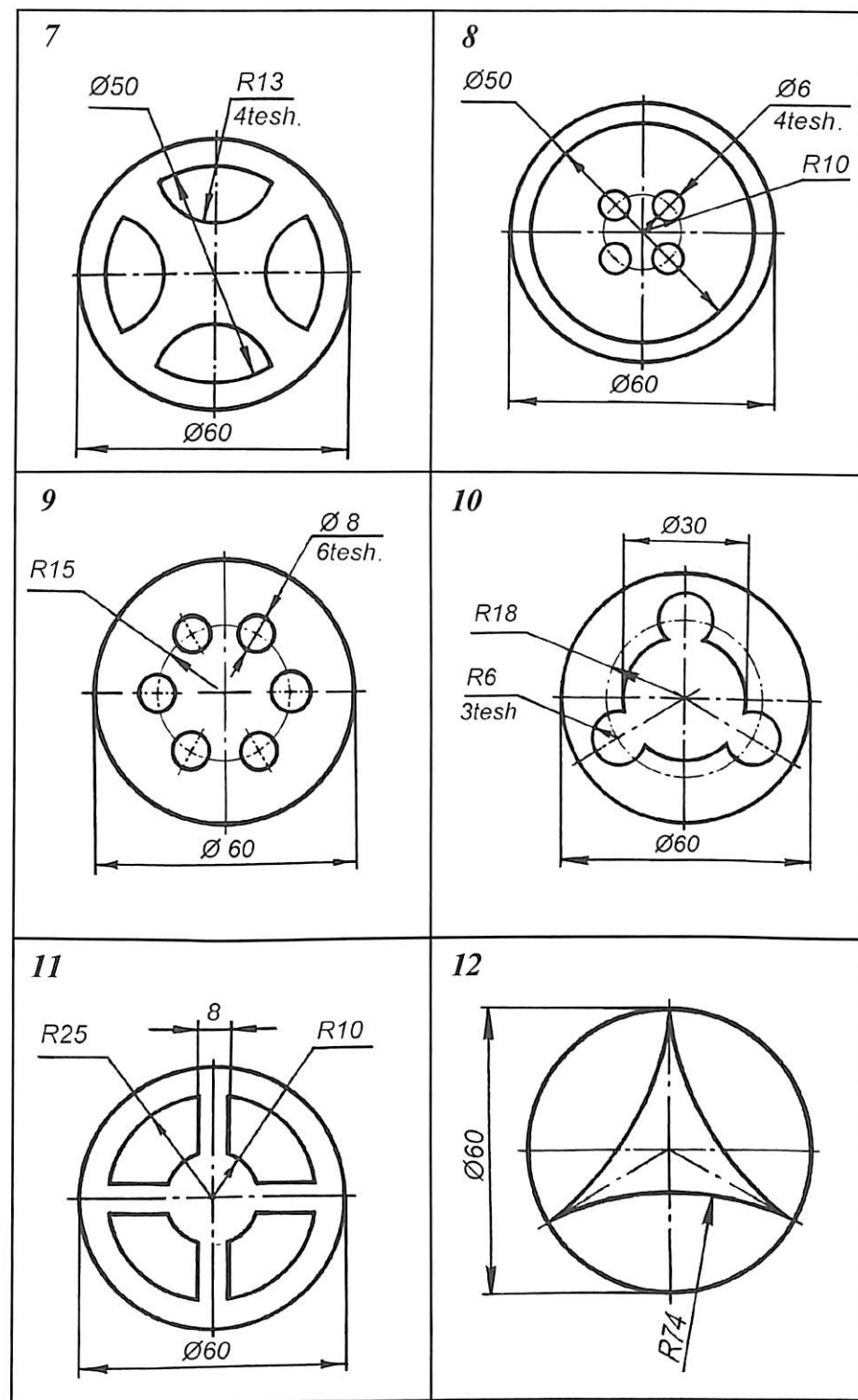
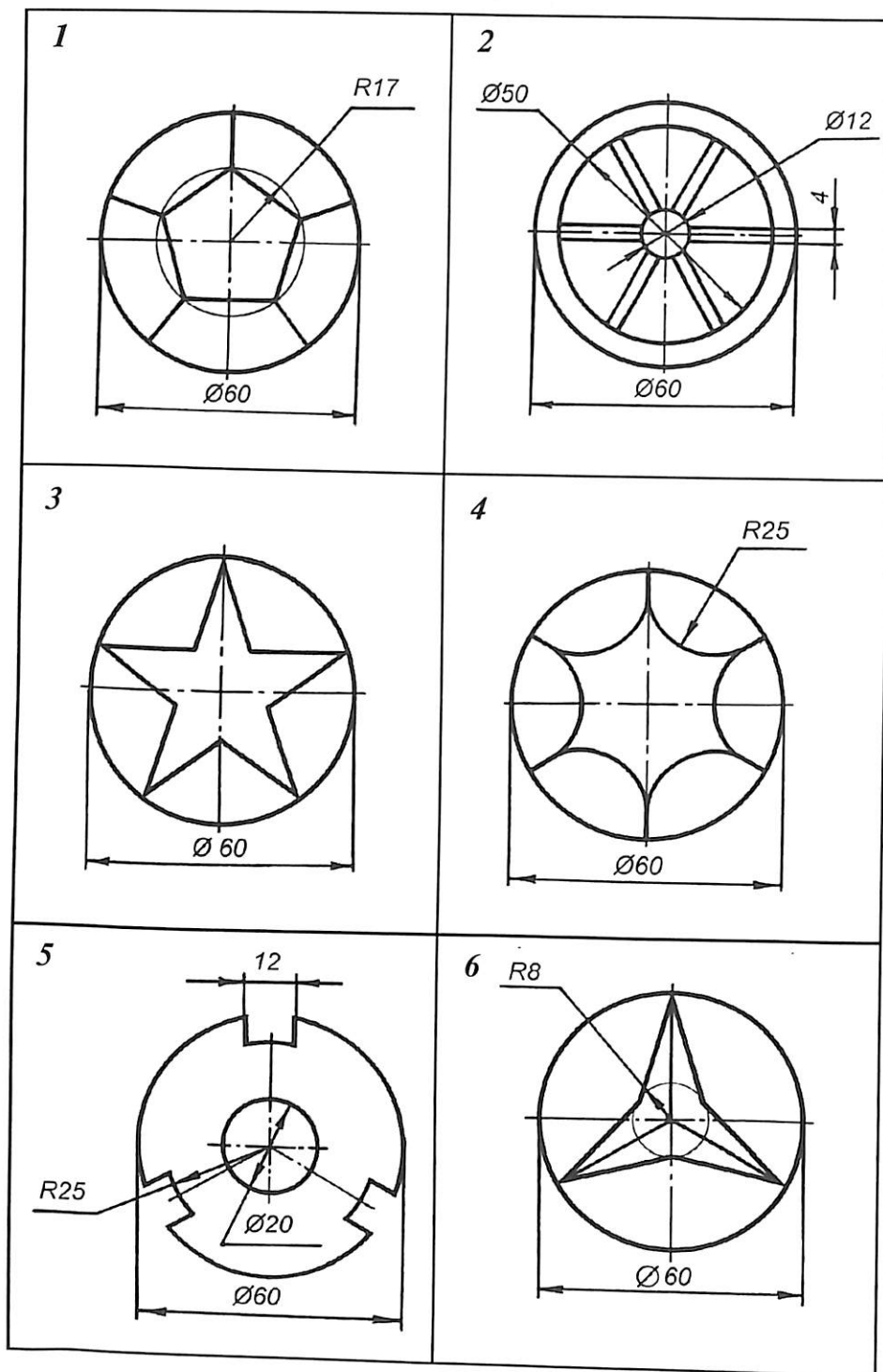
Konus asosi diametrining balandligiga nisbatiga konuslik deyiladi (topshiriq namunasidagi 2-shakl). Konuslik chizmada  $\Delta$  belgisi bilan ifodalanadi.

#### 3-topshiriq — «Geometrik yasashlar. Aylanani teng bo'laklarga bo'lish» namunasi

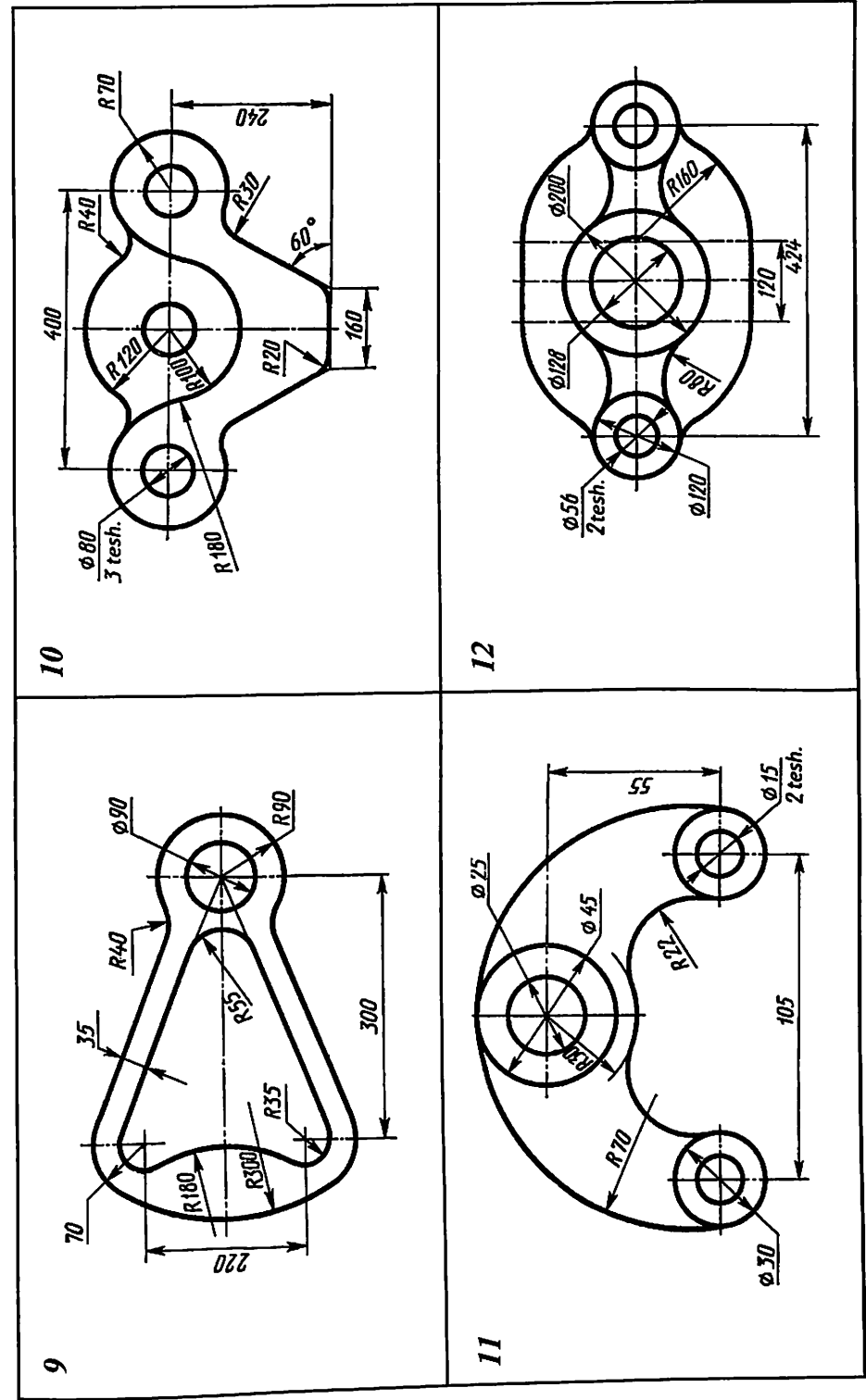
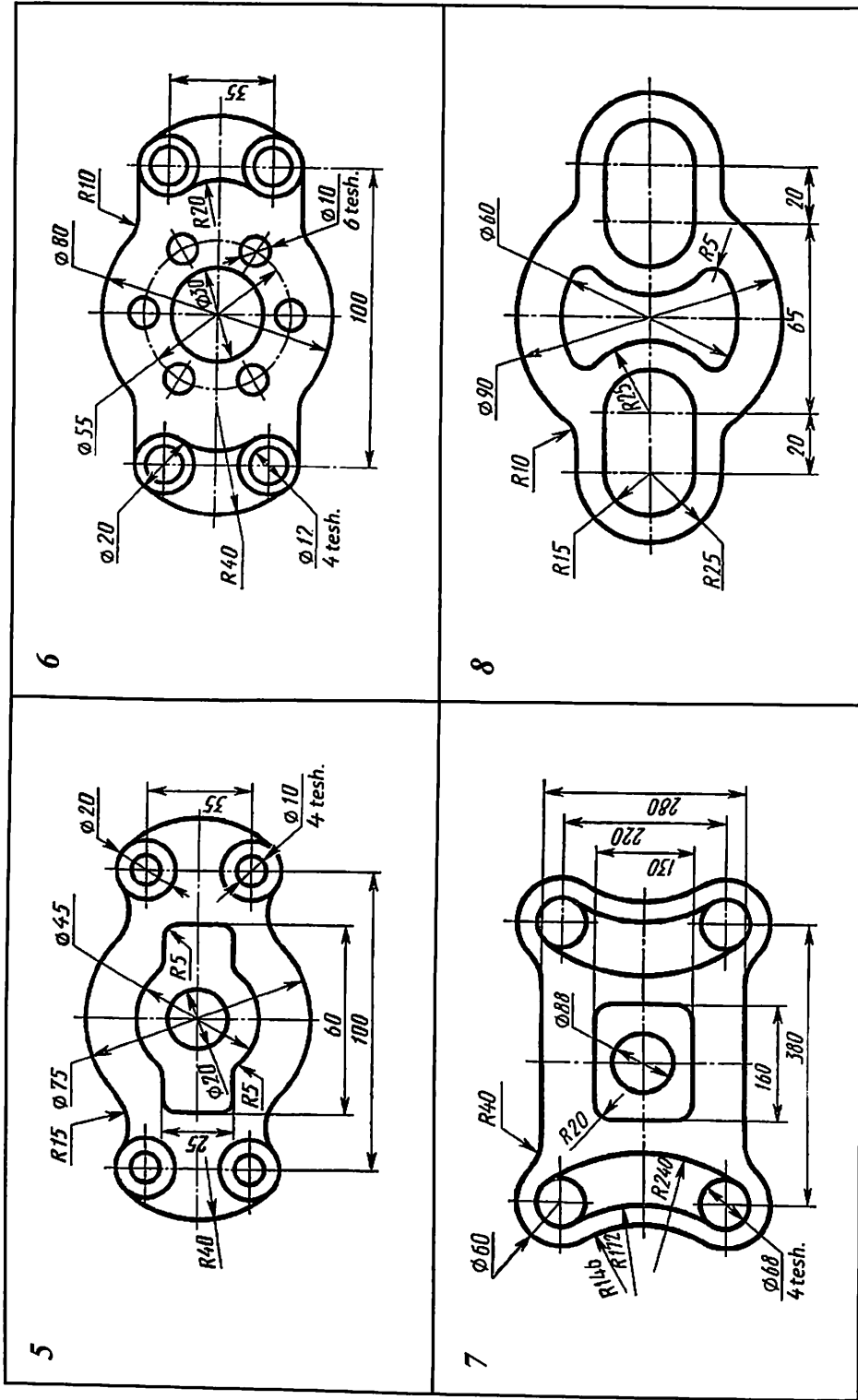


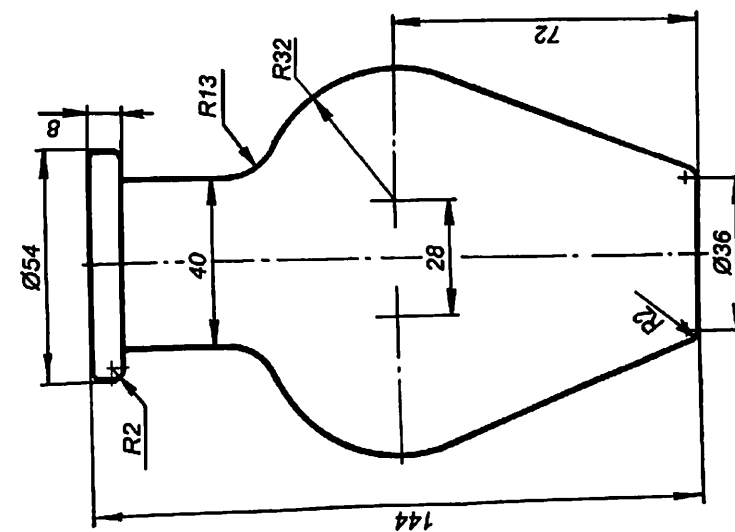
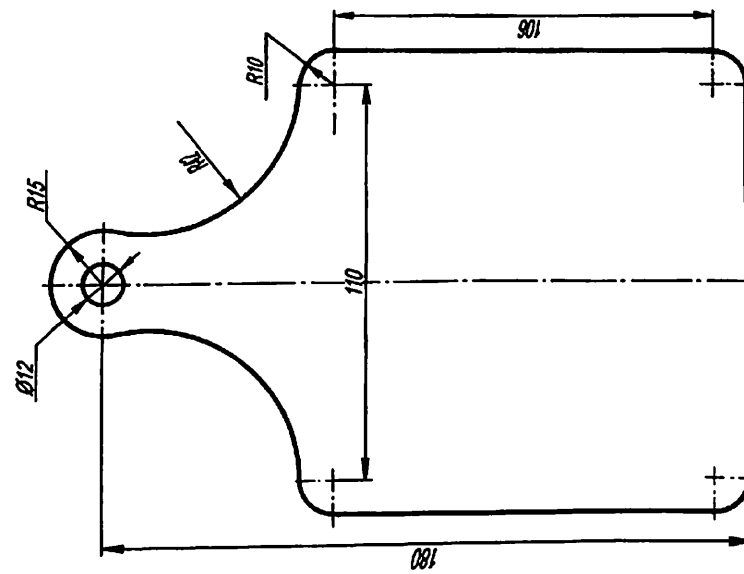
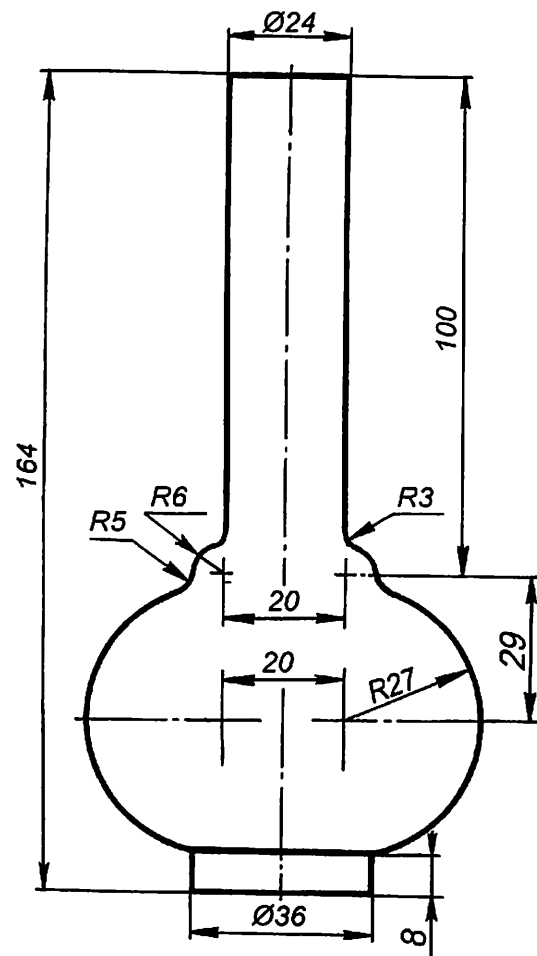


### 3-topshiriq variantlari





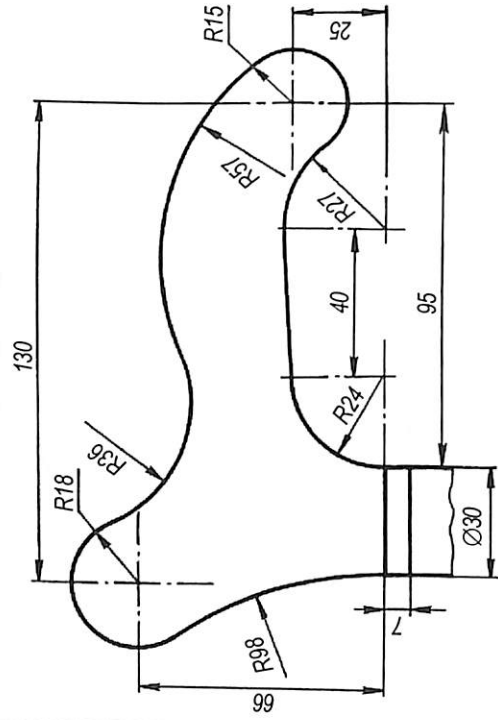




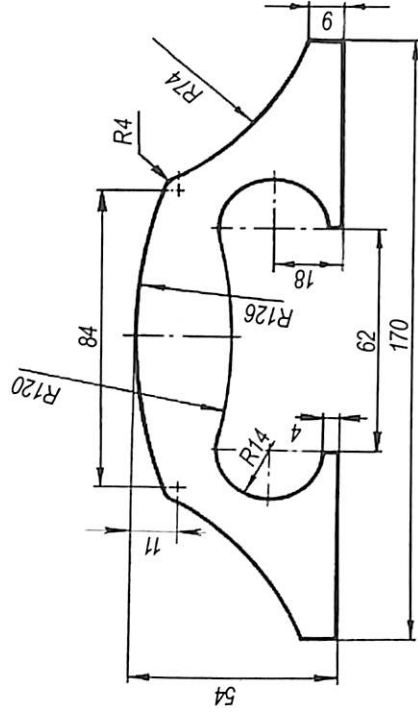




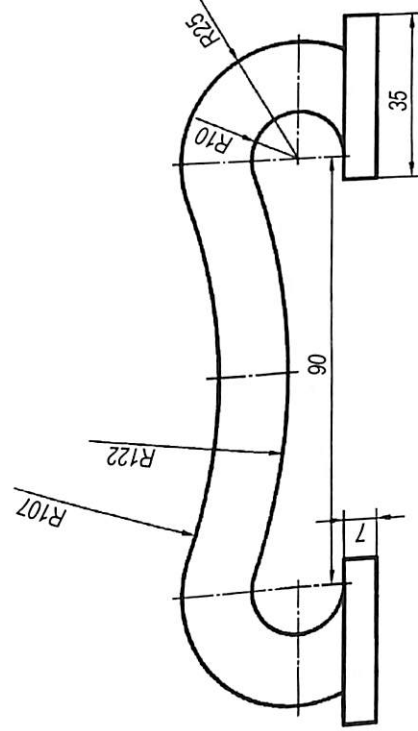
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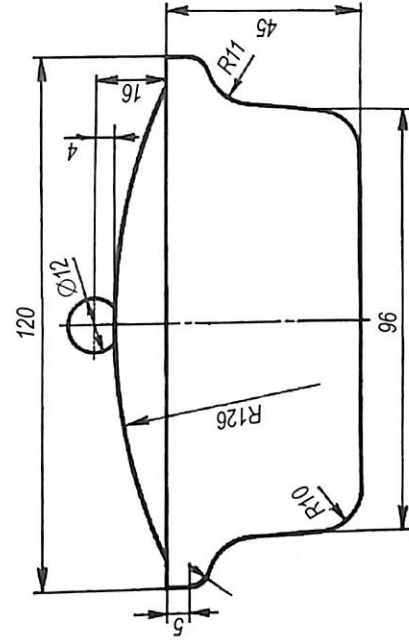
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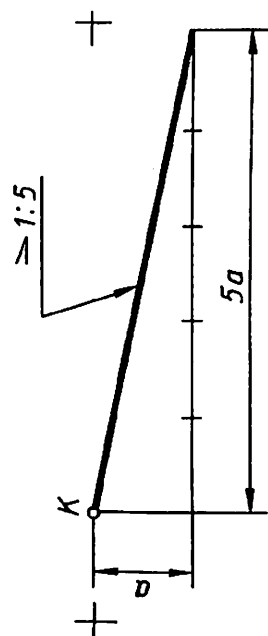
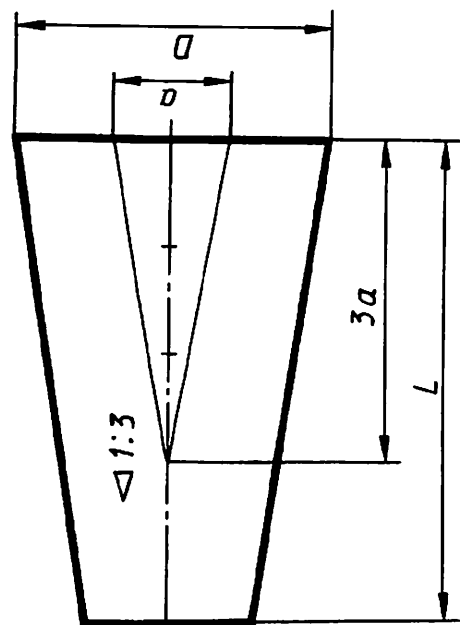
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10

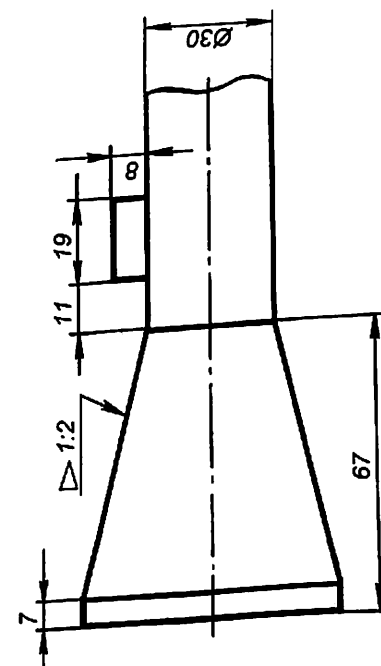


5-topshiriq – «Qiyalik va konusliklar» namunasi

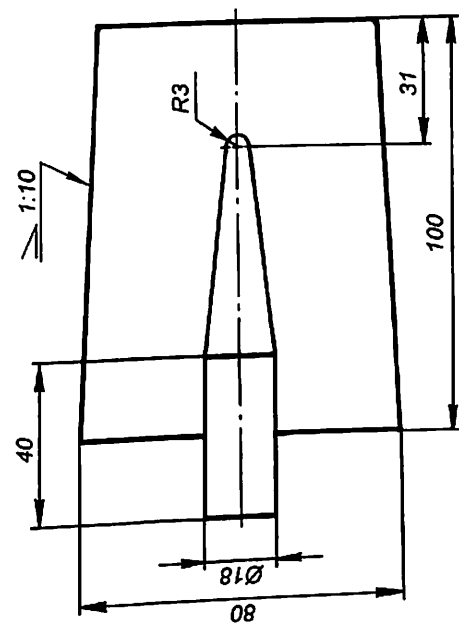


5-topshiriq variantlari

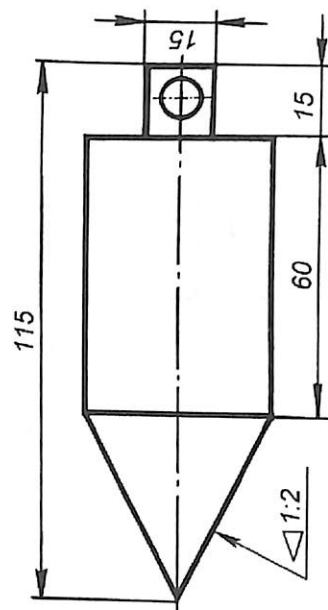
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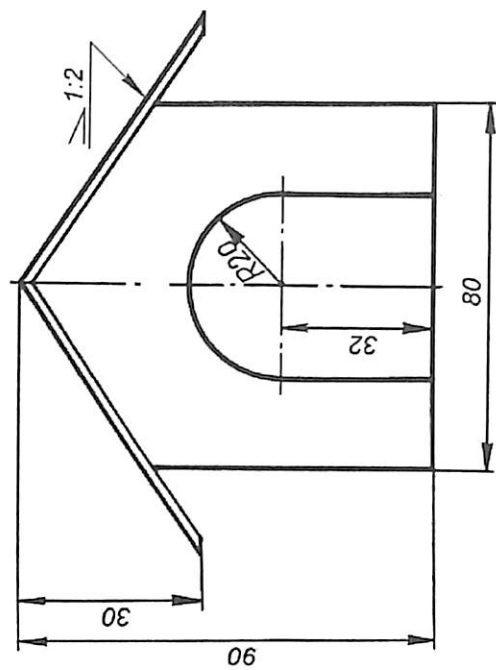
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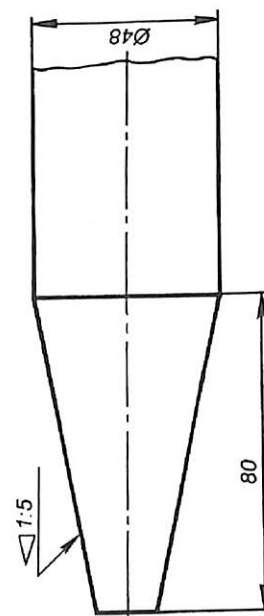
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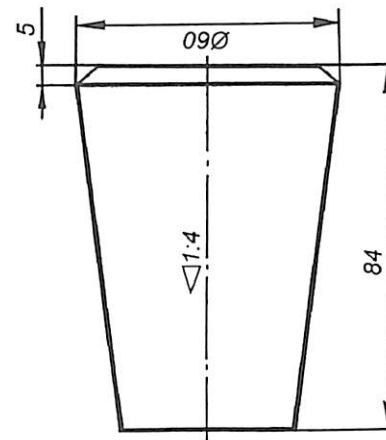
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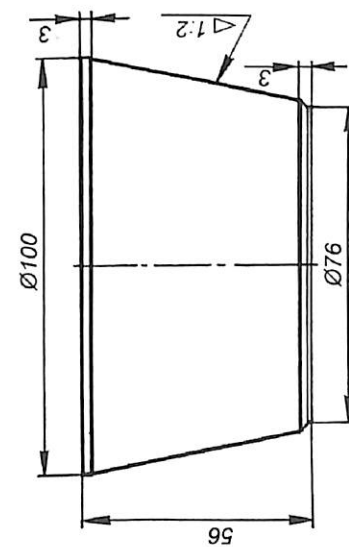
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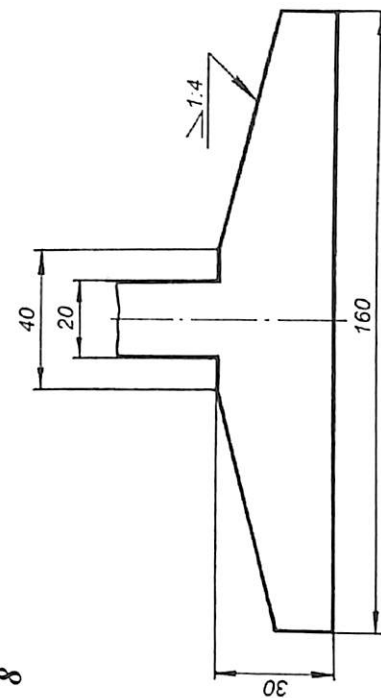
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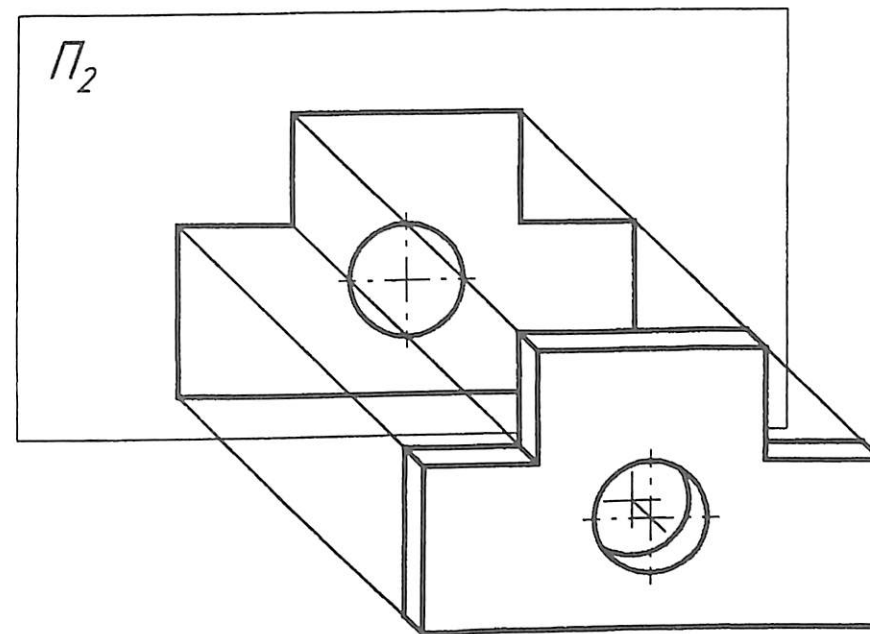


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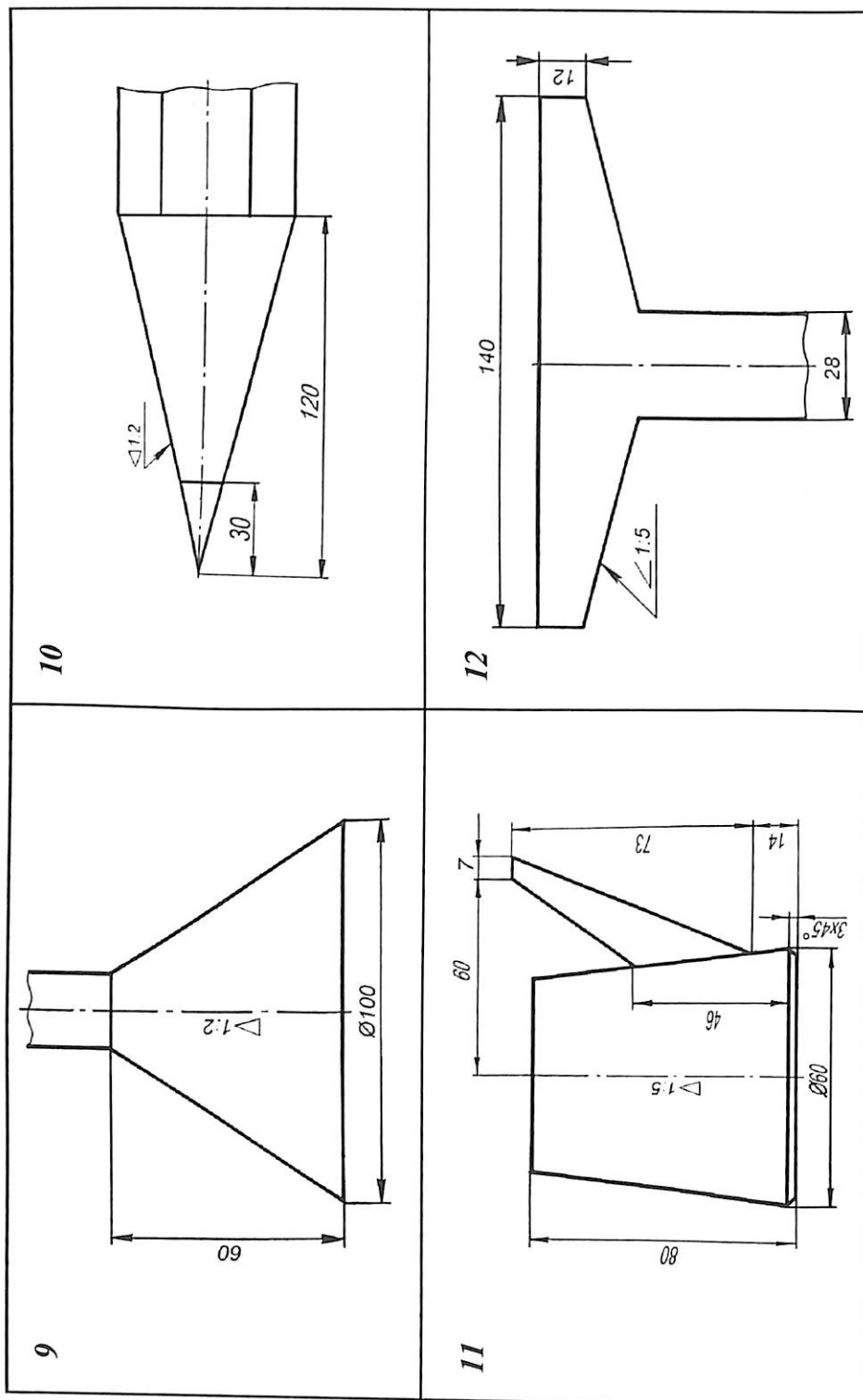




Qism No. 02

Qism

37







**14-topshiriq. Ko‘rinishning yarmi bilan qirqimning yarmini birlashtirishdagi yetishmovchi chiziqlarini bajarish**

Topshiriqda simmetriya o‘qiga ega detal ko‘rinishining yarmi bilan qirqimi yarmining tugallanmagan chizmasi berilgan. Chizmadagi yetishmovchi chiziqlarni o‘tkazishdan avval o‘quvchilar detal shakli qanday geometrik jismlar yig‘indisidan hosil bo‘lganini aniqlab olishlari kerak bo‘ladi.

**15-topshiriq. Detalning ikkita ko‘rinishiga asosan uning texnik chizmasini bajarish**

Topshiriq variantlarining murakkablik darajasi ikki xil qilib tuzilgan. Toq variantlarda sodda detallarning ko‘rinishlari bo‘lib, ular bo‘yicha bajarilgan texnik rasmlar qirqimlarsiz bajariladi (namunadagi 1-shakl). Juft variantlardagi detallarning tuzilishi birmuncha murakkabroq bo‘lib, 1/4 qismi qirqib tasvirlangan texnik rasm bajarilishi ko‘zda tutilgan (namunadagi 2-shakl).

**16-topshiriq. Yaqqol tasvir bo‘yicha tarkibida kesim tasvirlangan detal chizmasini bajarish**

Bu topshiriqda detalning yaqqol tasviriga asosan uning bosh ko‘rinishi aniqlanadi. Detal tarkibiy qismlarining nisbatlari taxminan saqlangan holda bosh ko‘rinish A4 formatli chizma qog‘oziga chizib olinadi. Shundan keyin zarur kesimlar standart talablariga mos holda chizilib, o‘lchamlar qo‘yiladi.

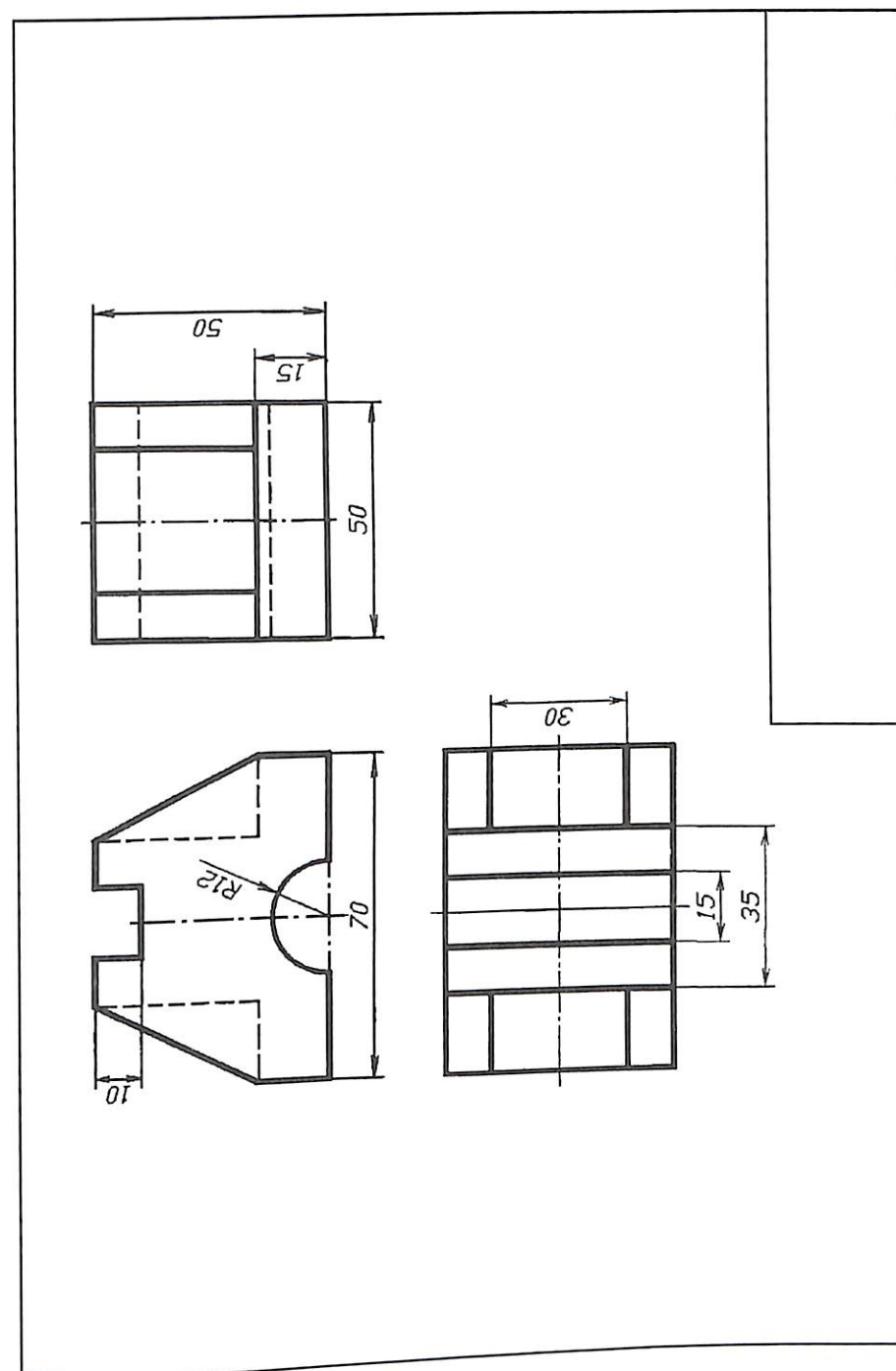
**17-topshiriq. Oddiy qirqim chizmasini bajarish**

Topshiriq o‘quvchilarda qirqim bajarish ko‘nikmalarini shakllantirishga mo‘ljallangan. O‘quvchilar detal shakli va kesuvchi tekislikning vaziyatini aniq tasavvur qilishlari uchun ularga berilgan detalning texnik rasmi qoralamasini chizib ko‘rishni taklif qilish mumkin. Topshiriq A4 formatli chizma qog‘ozida namunada keltirilgan shaklda bajariladi.

**18-topshiriq. Murakkab qirqim chizmasini bajarish**

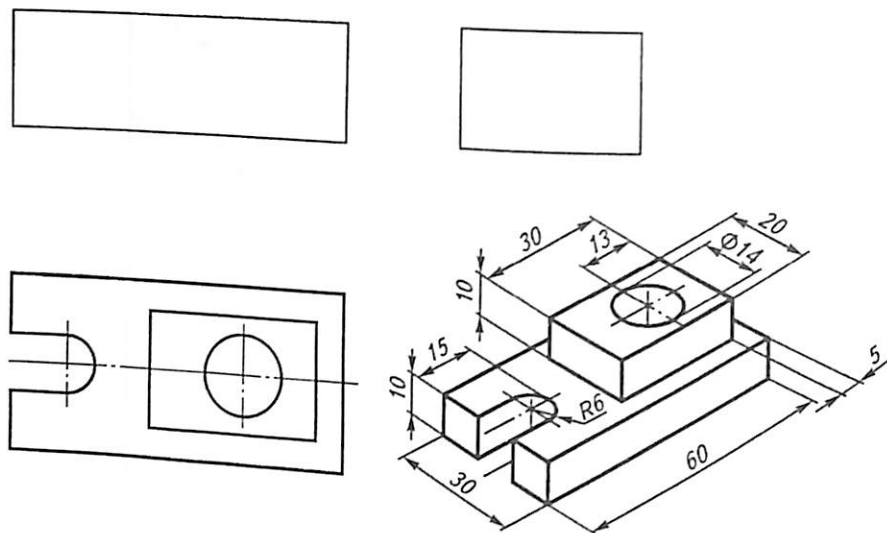
Bir nechta tekisliklardan foydalanib hosil qilingan qirqimga murakkab qirqim deyiladi. Topshiriqdagi 1–6-variantlar pog‘onali, 7–12-variantlar qiya qirqimlar ko‘rinishida bajariladi.

**6-topshiriq — «Detailning yaqqol tasviri bo‘yicha ko‘rinishlarini bajarish» namunasi**

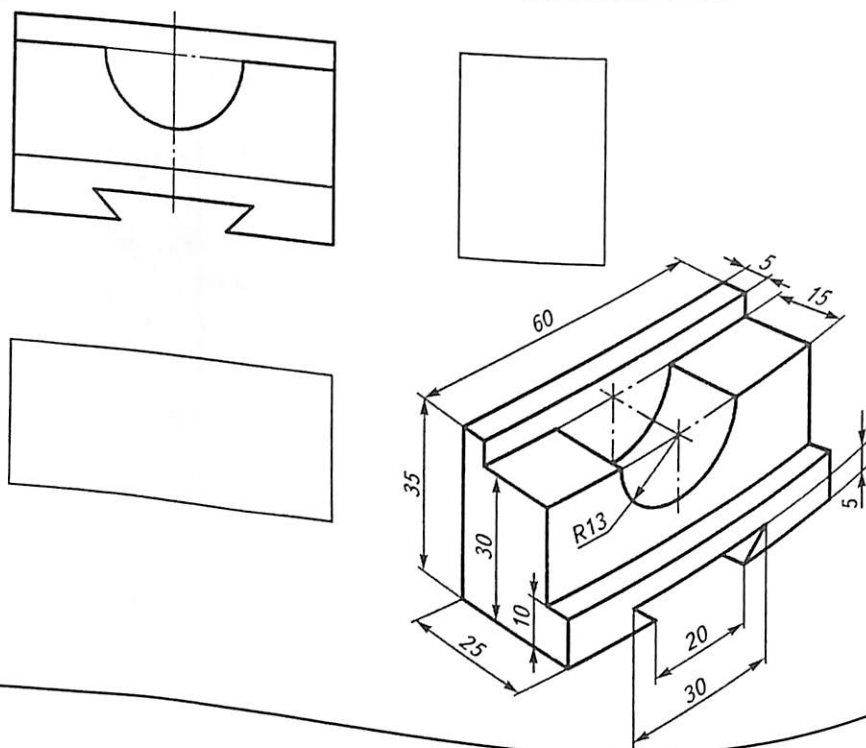


# 6-topshiriq variantlari

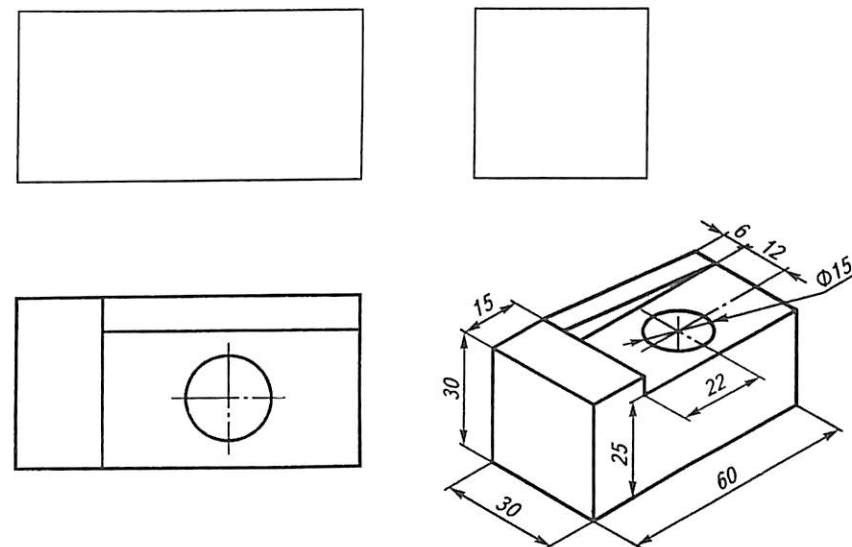
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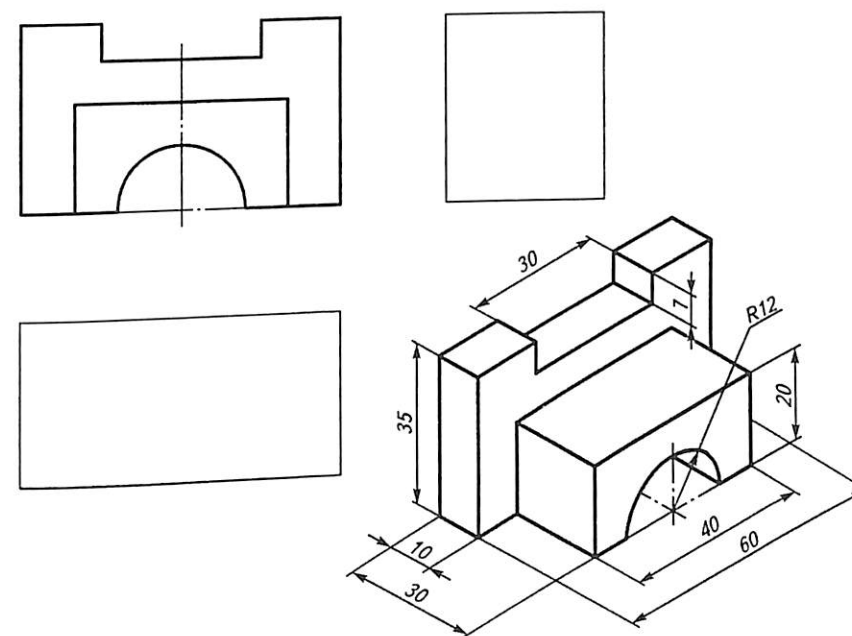
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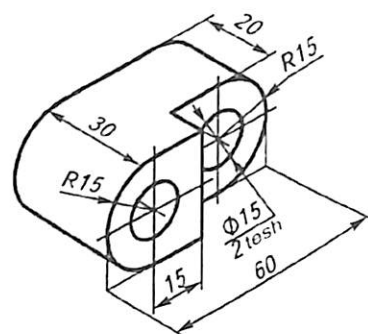
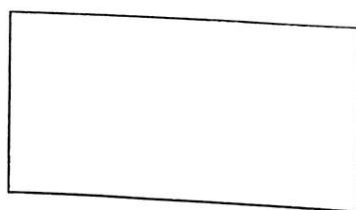
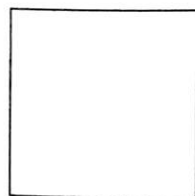
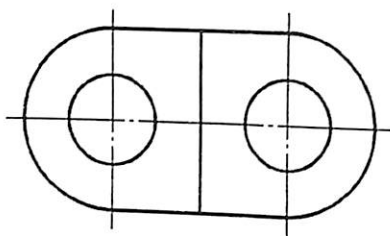
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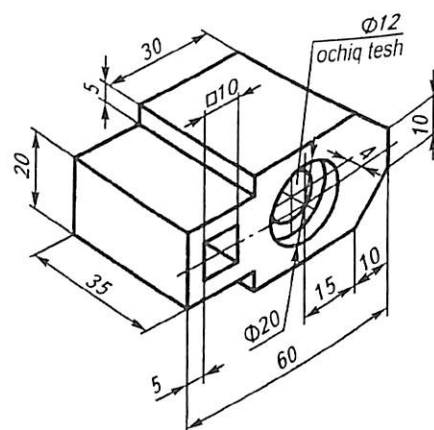
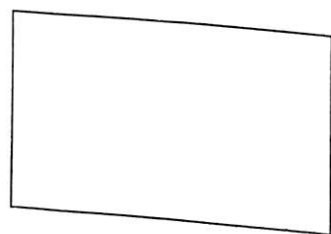
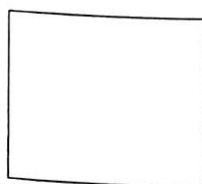
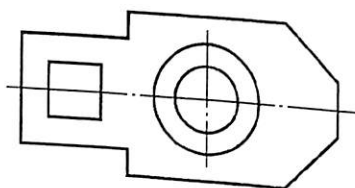
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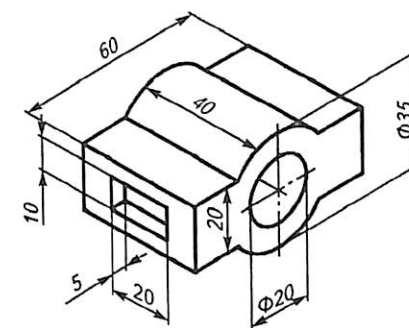
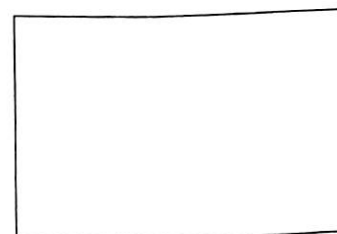
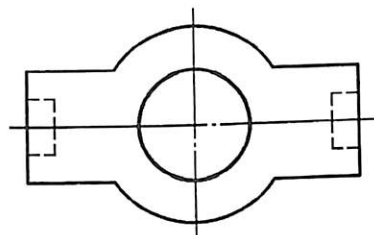
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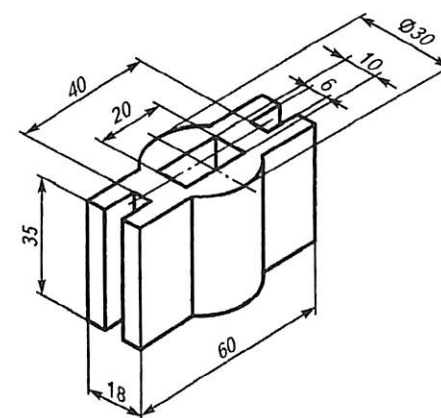
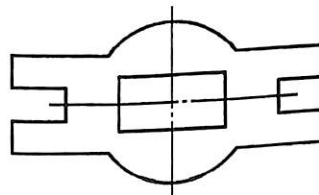
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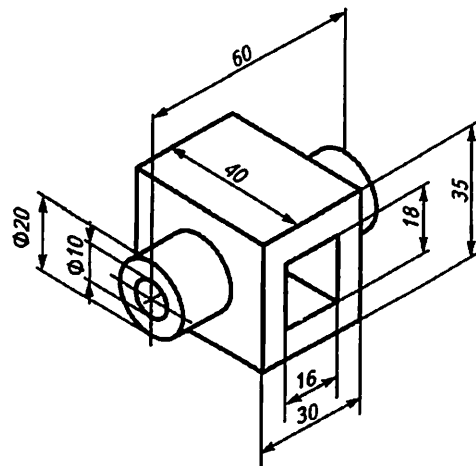
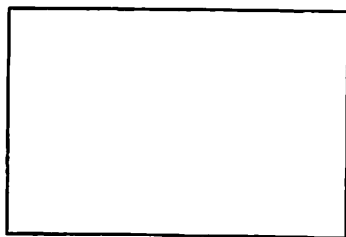
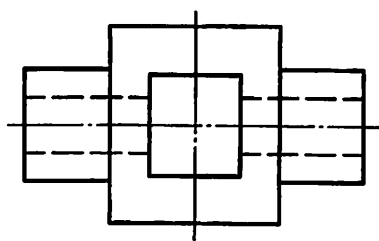
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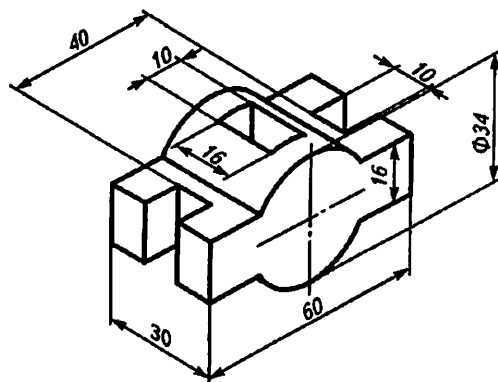
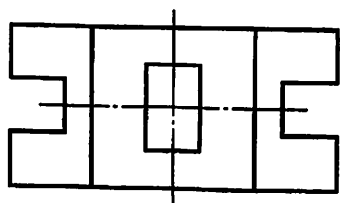
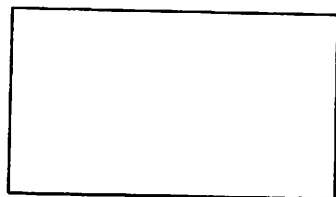
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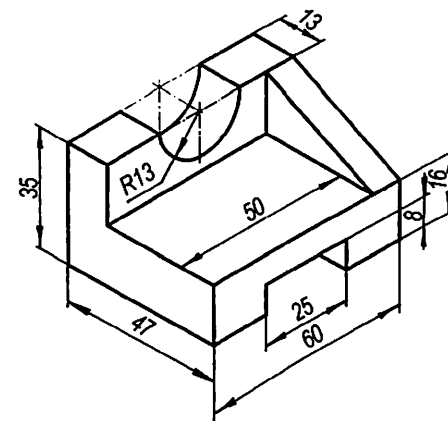
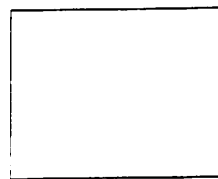
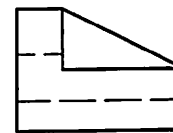
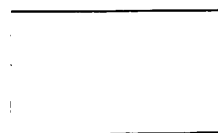
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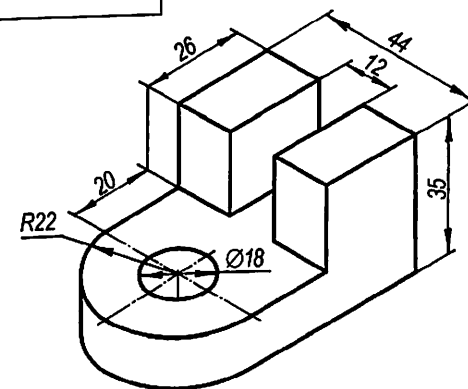
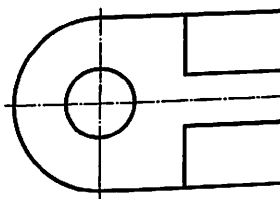
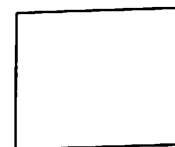
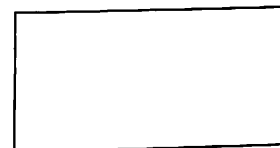
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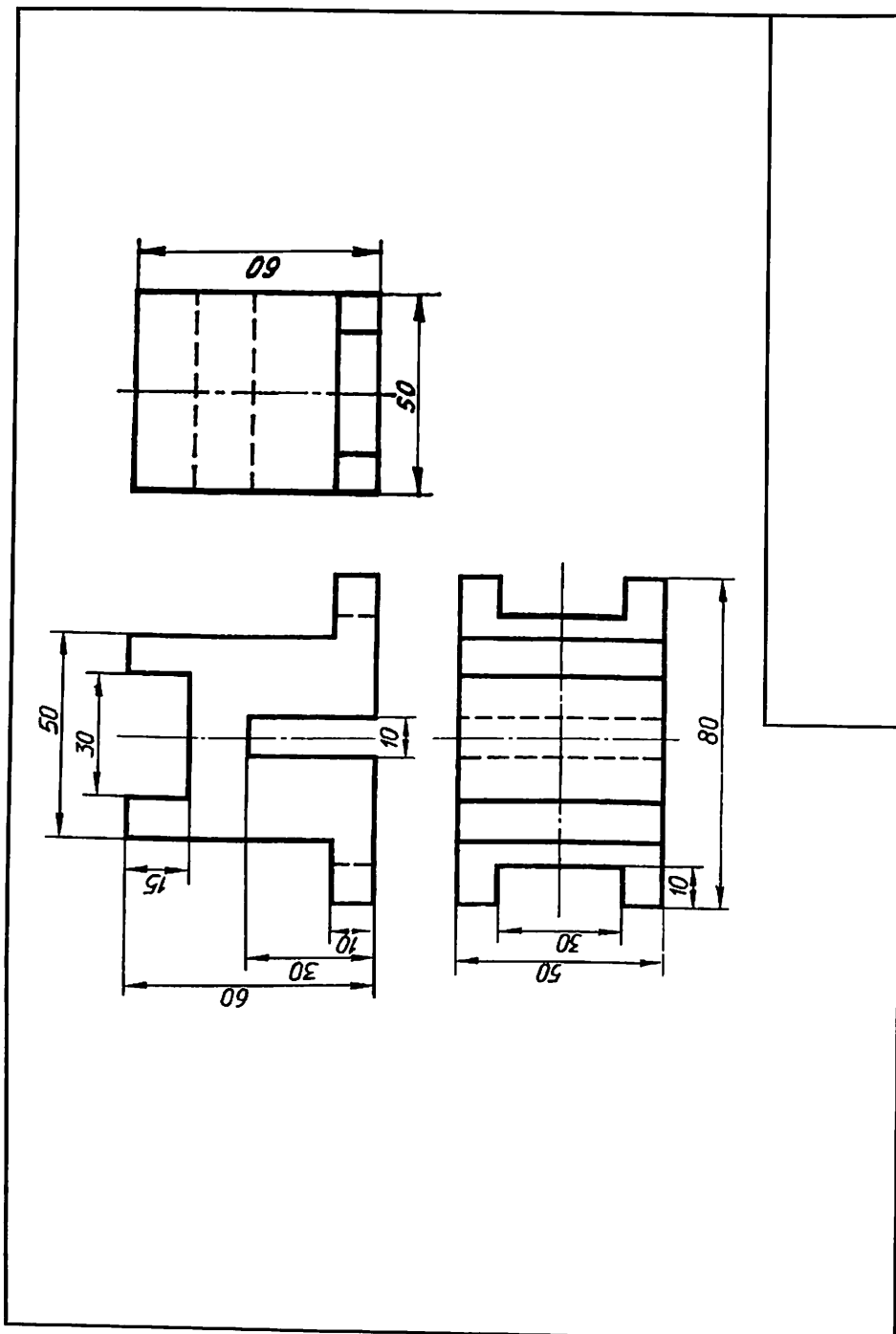
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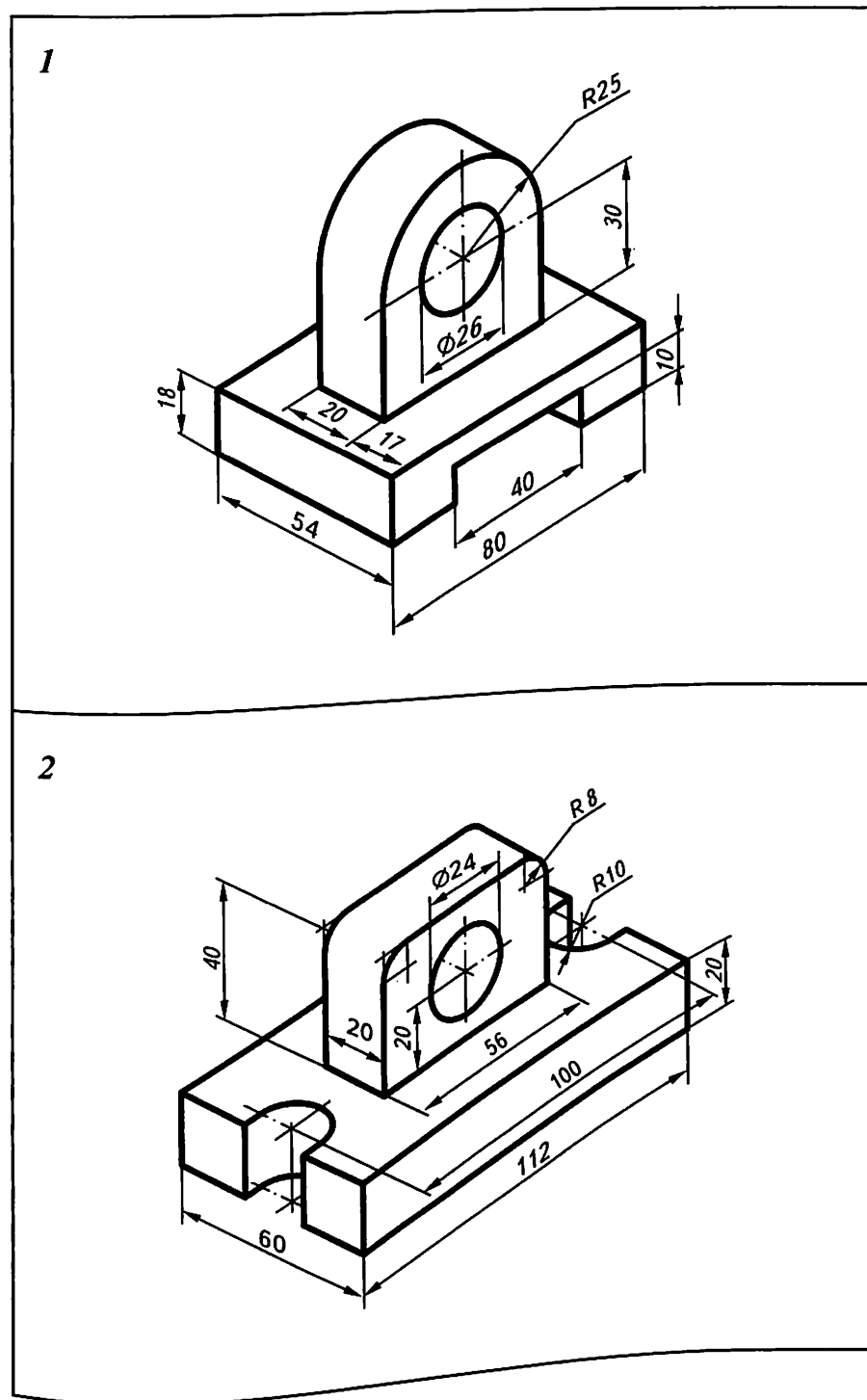
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7-topshiriq — «Detalning yaqqol tasviri bo'yicha ko'rinishlarini bajarish» namunasi

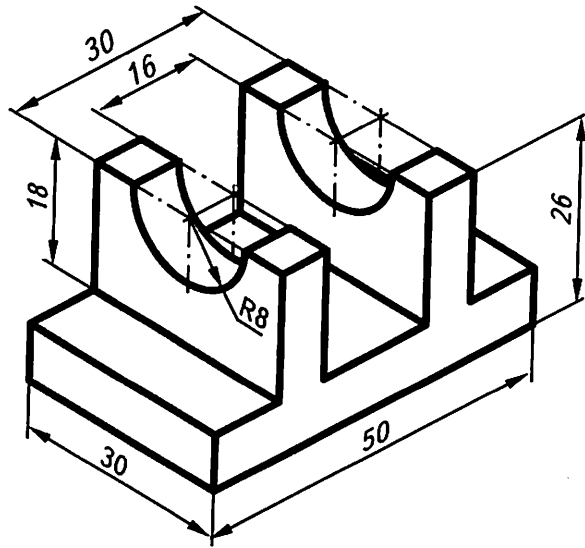


7-topshiriq variantlari

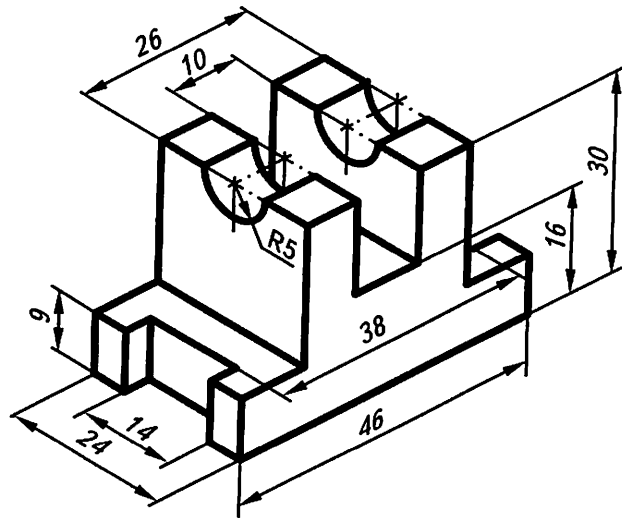




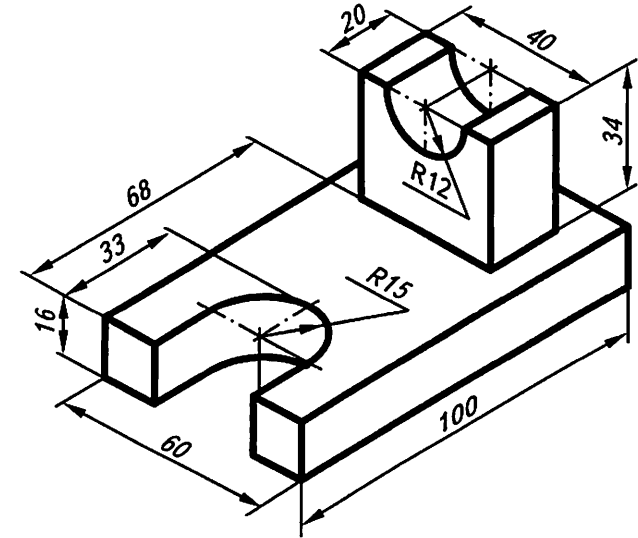
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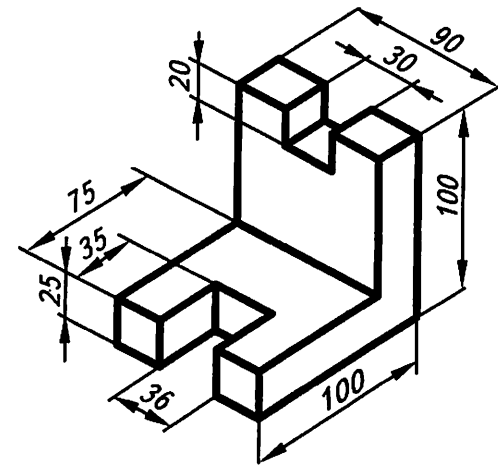
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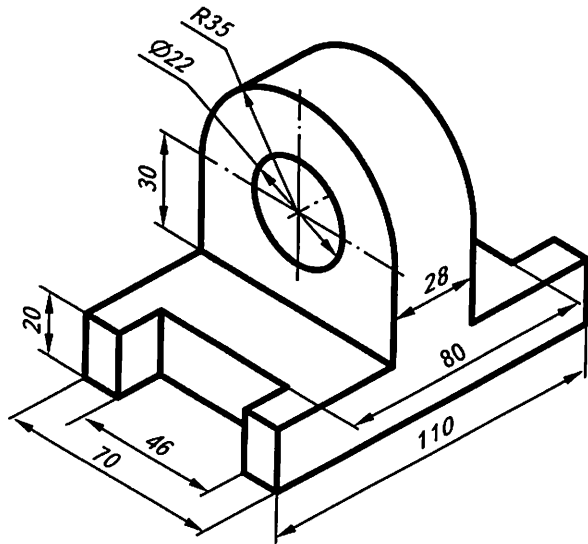
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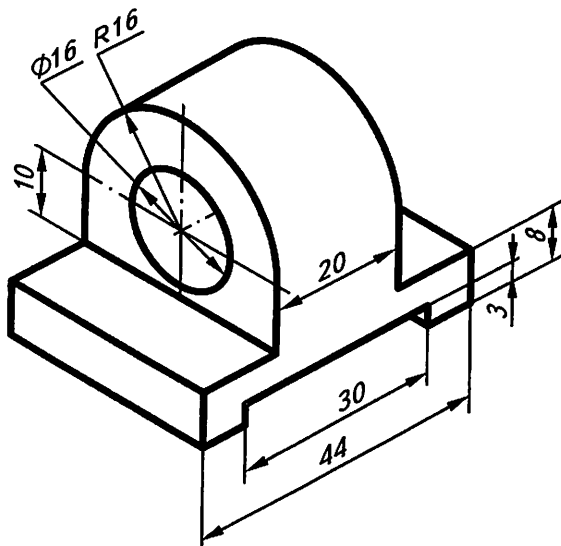
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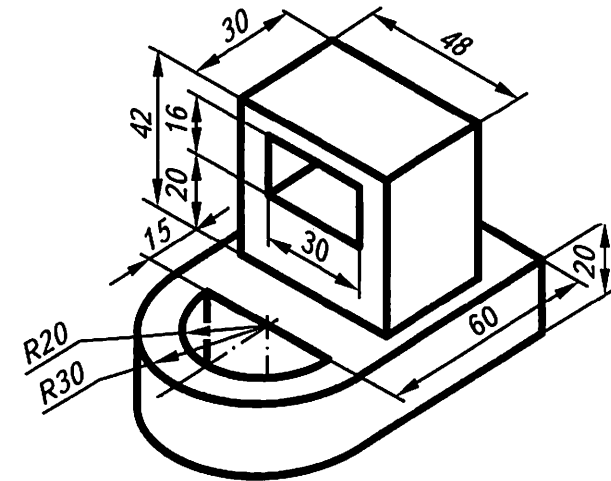
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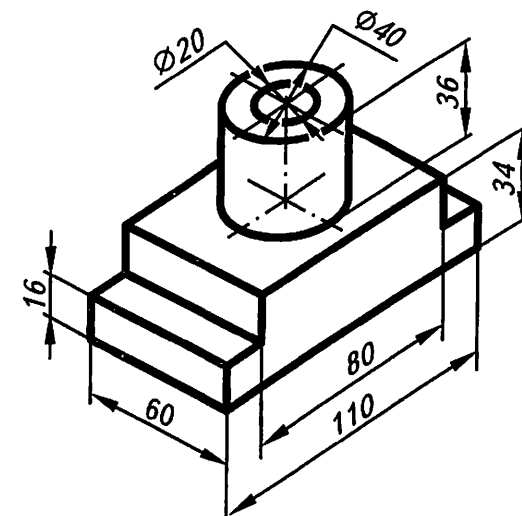
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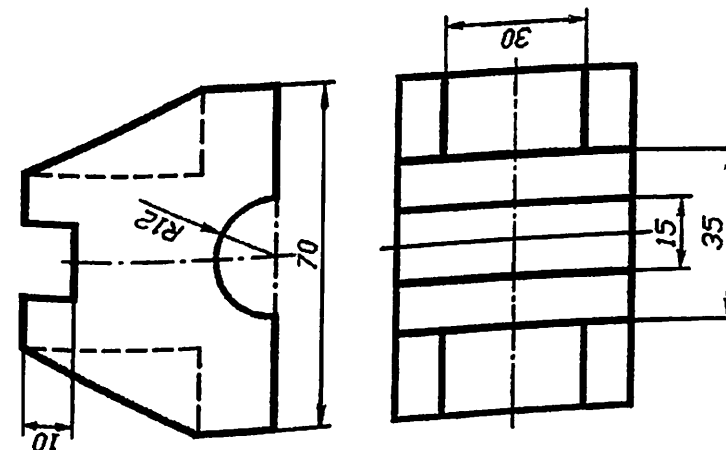
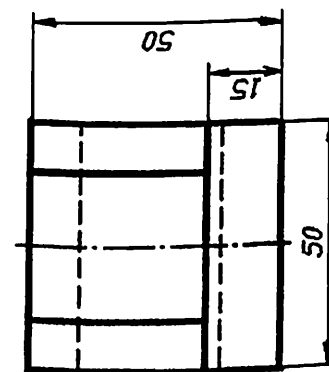
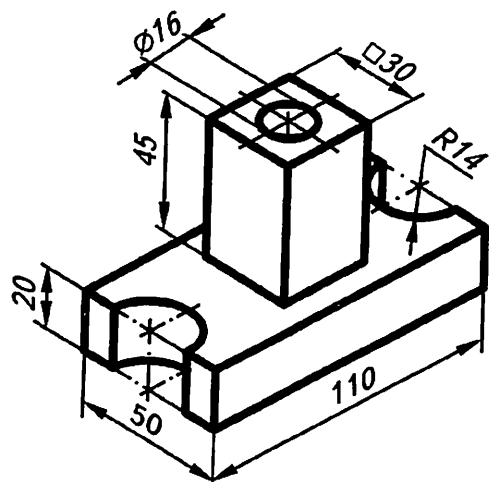
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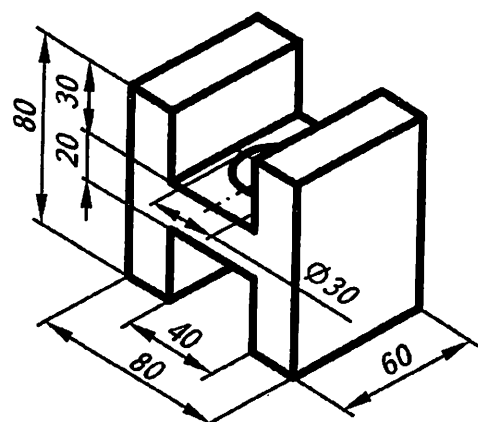
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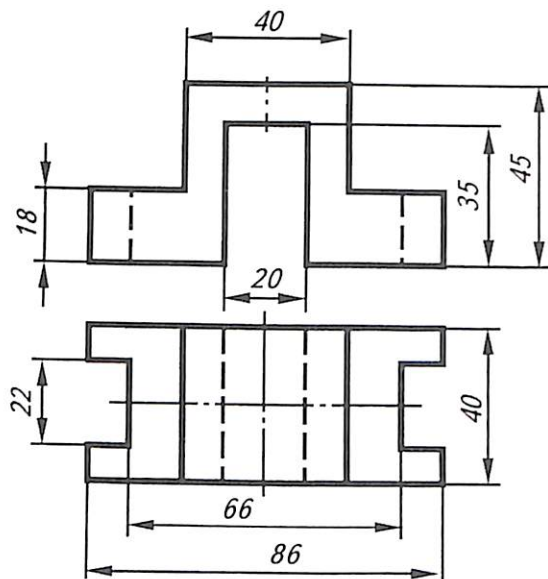


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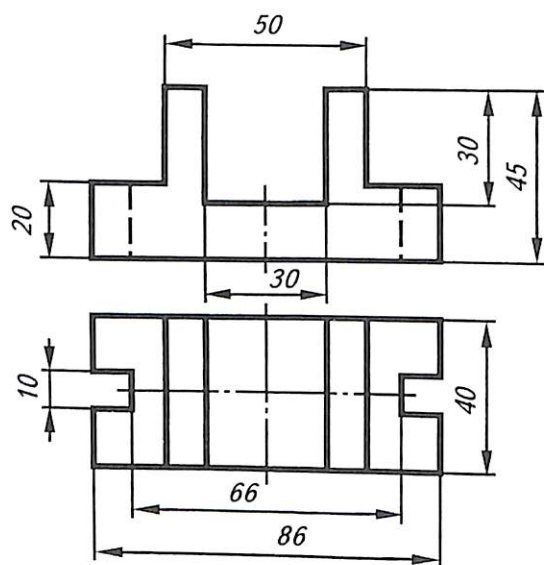


# 8-topshiriq variantlari

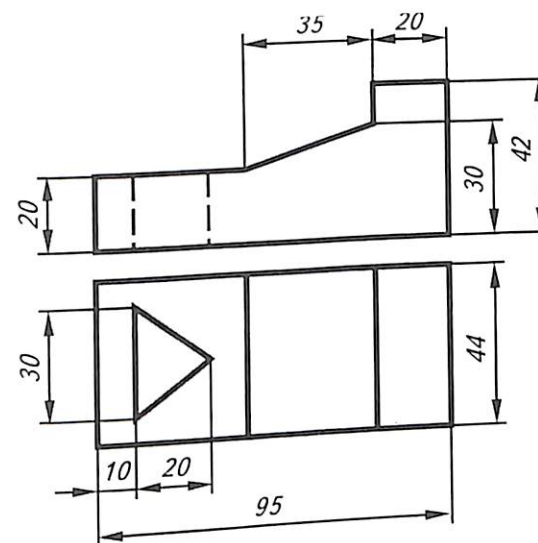
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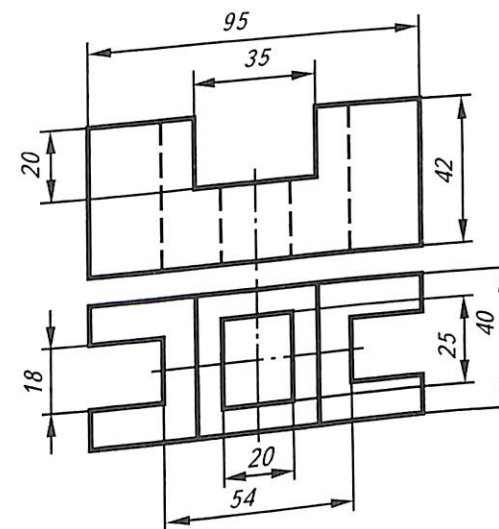
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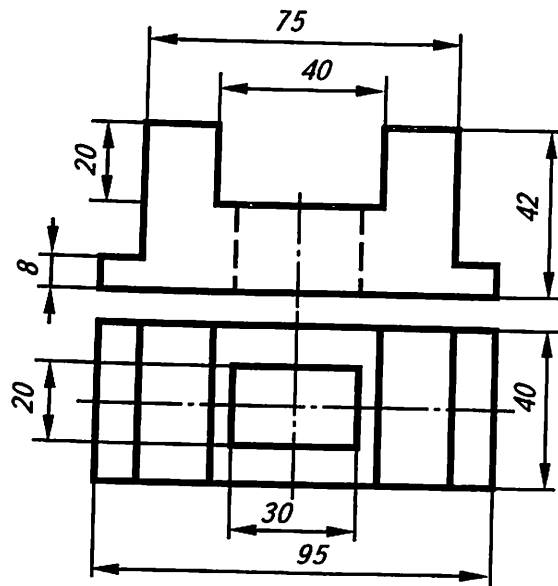
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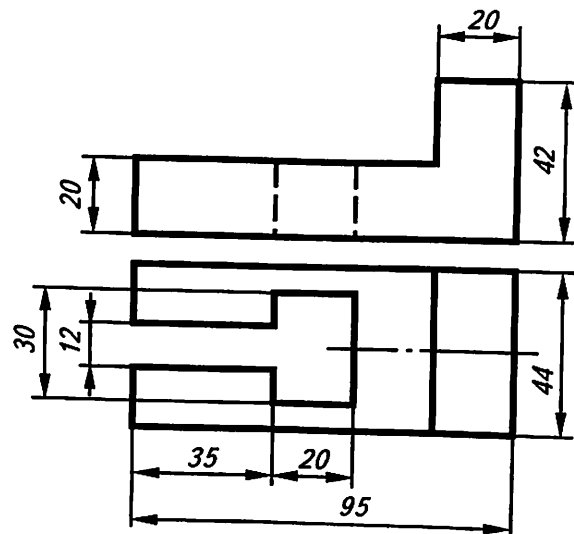
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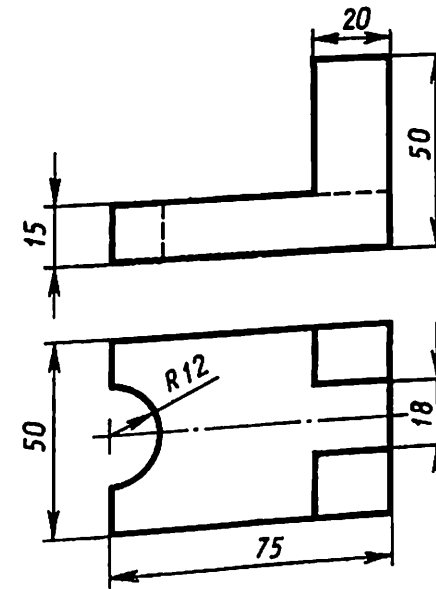
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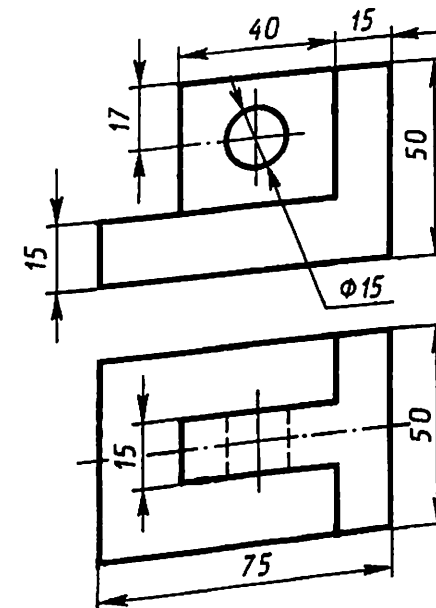
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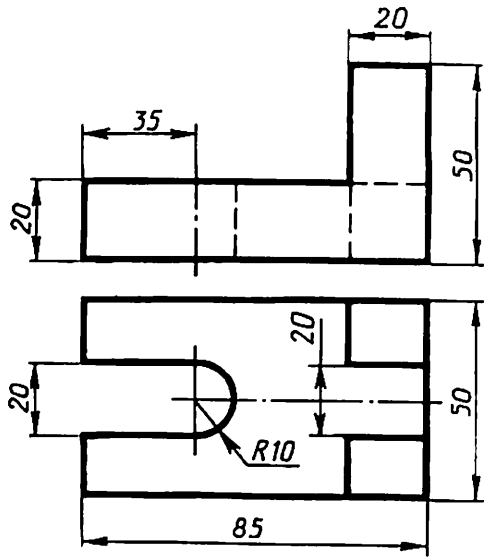
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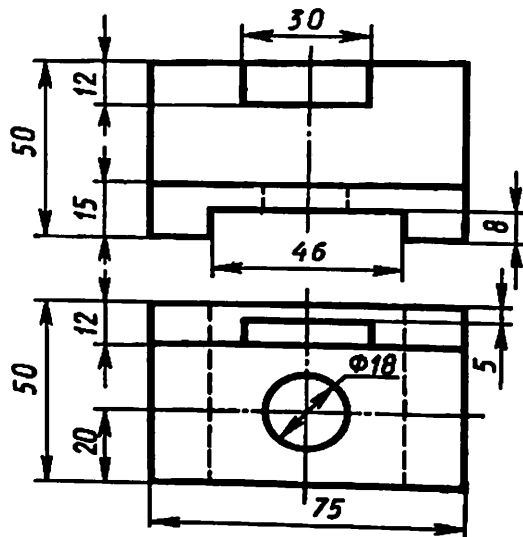
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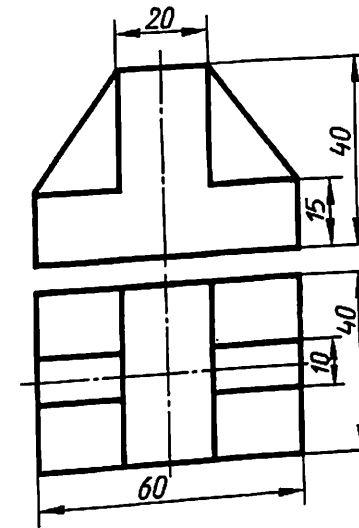
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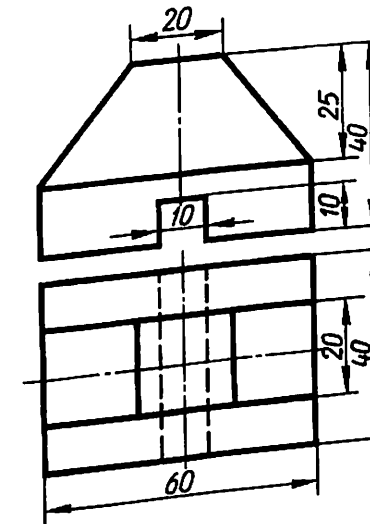
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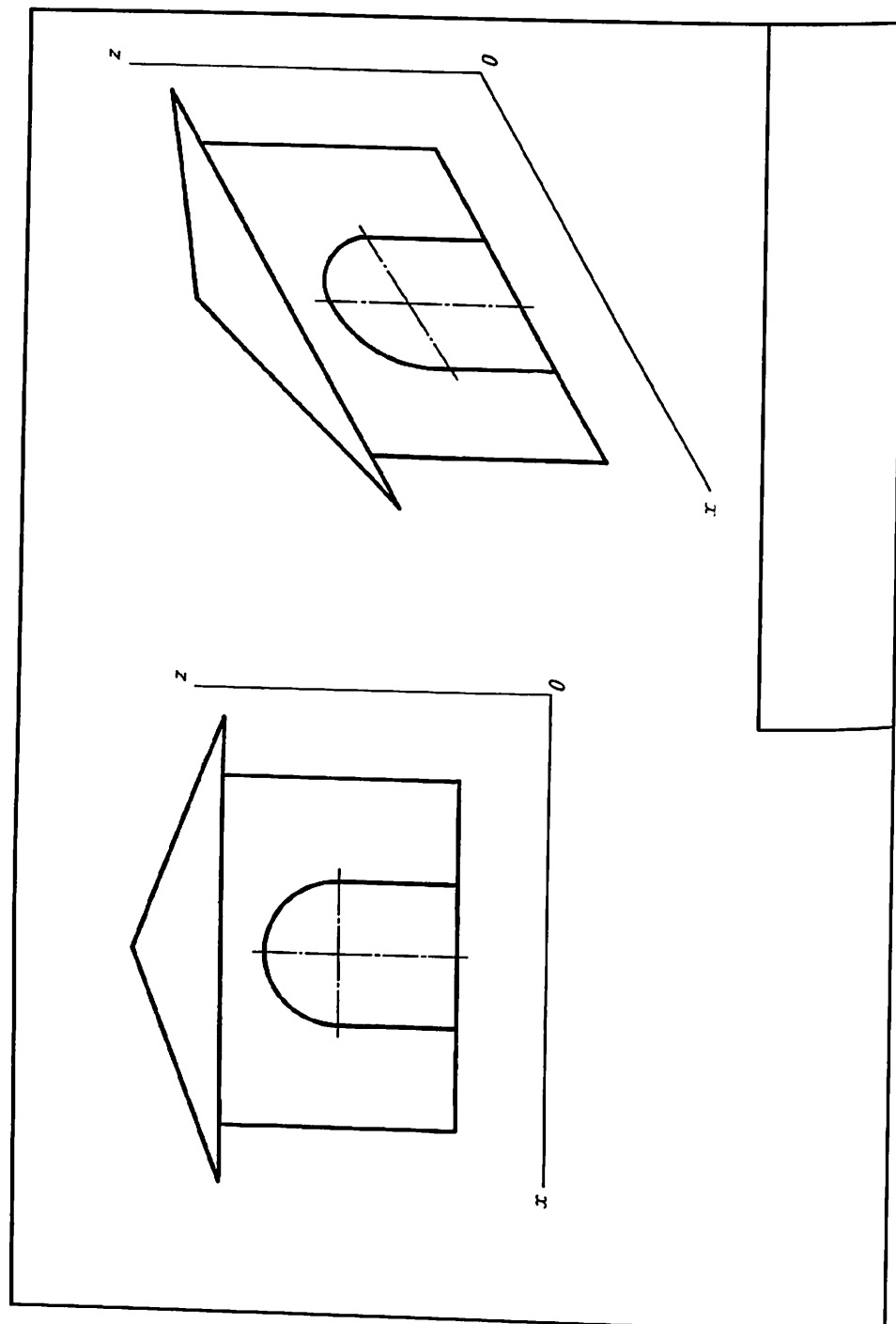
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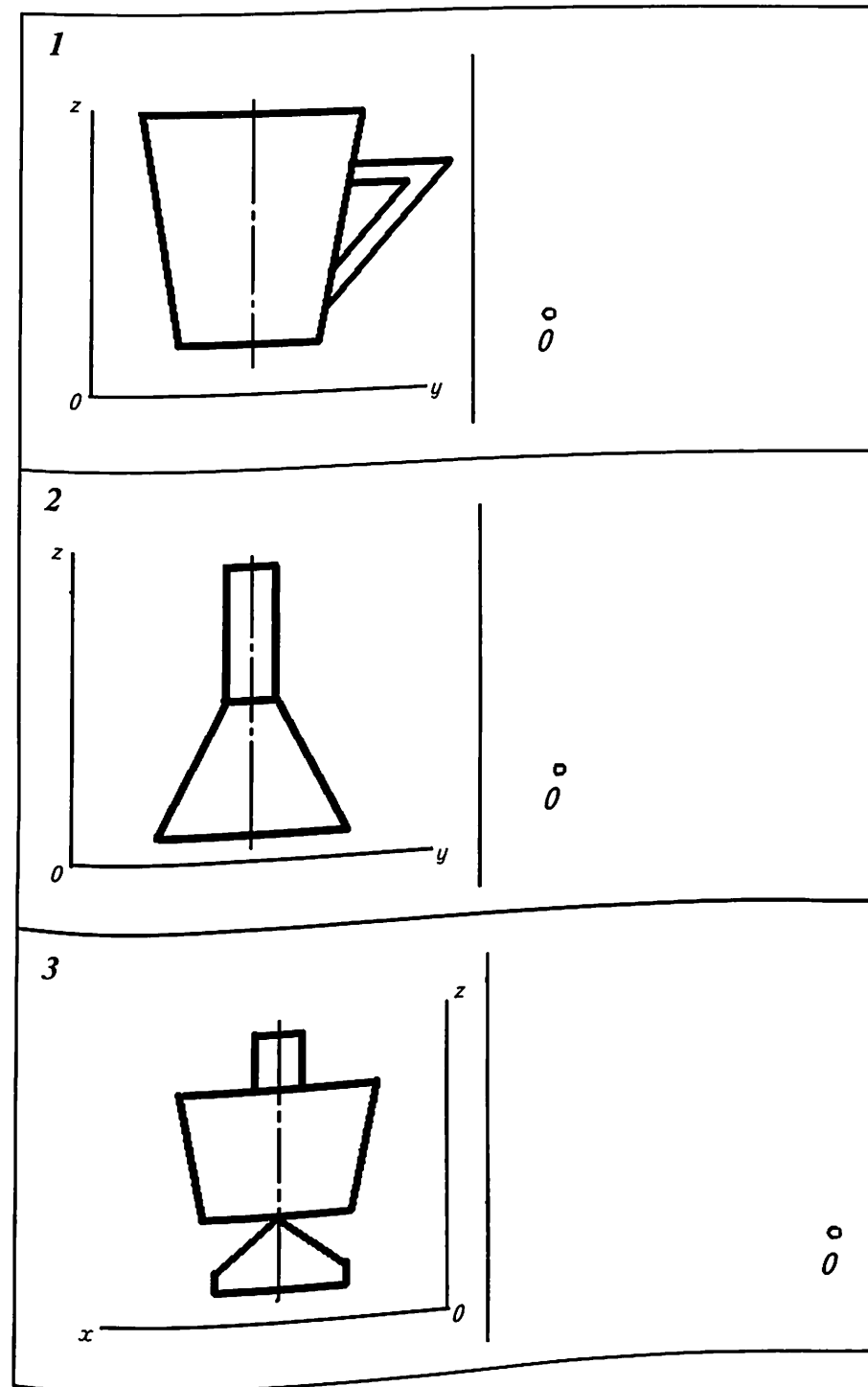
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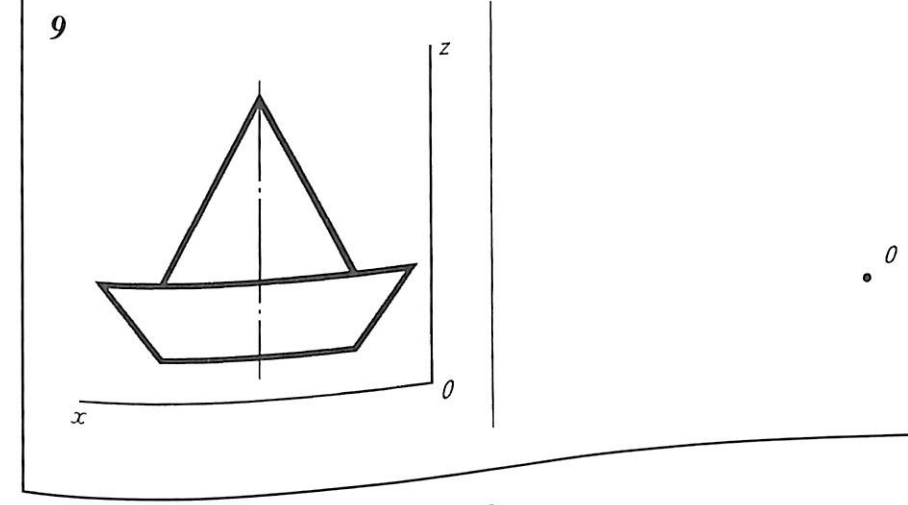
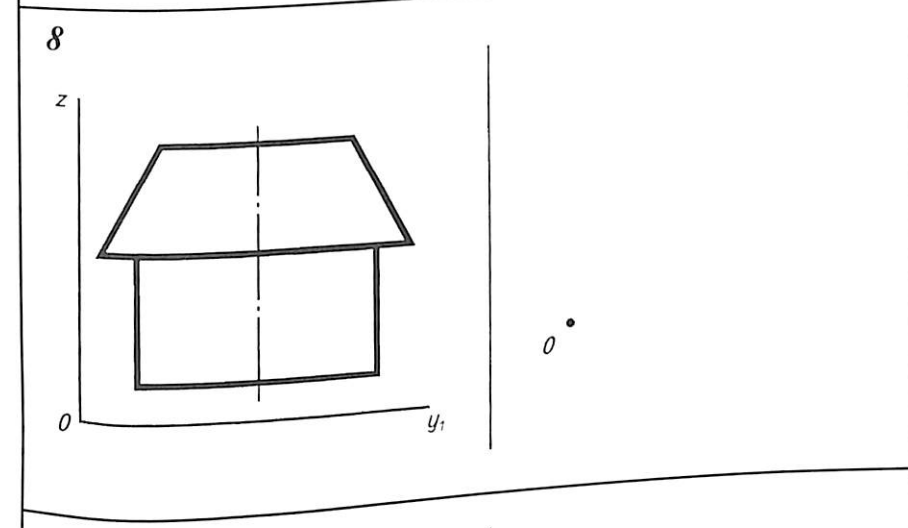
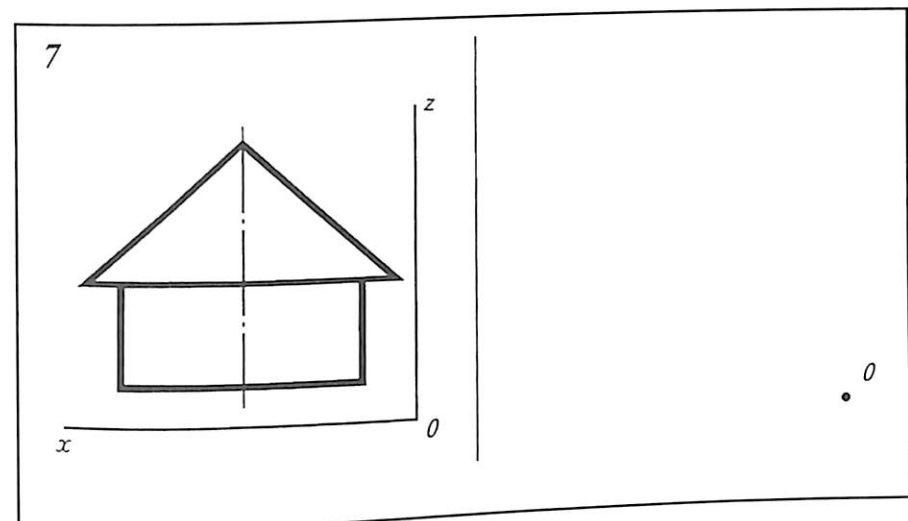
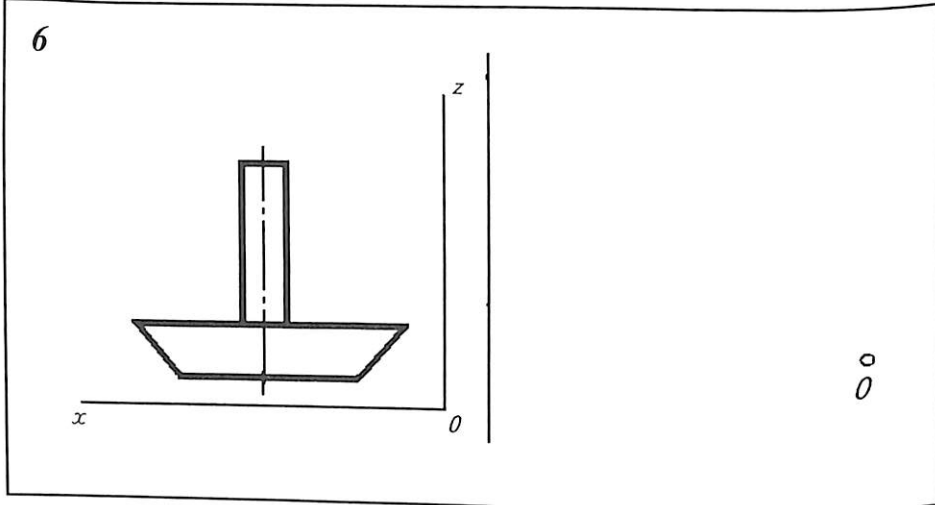
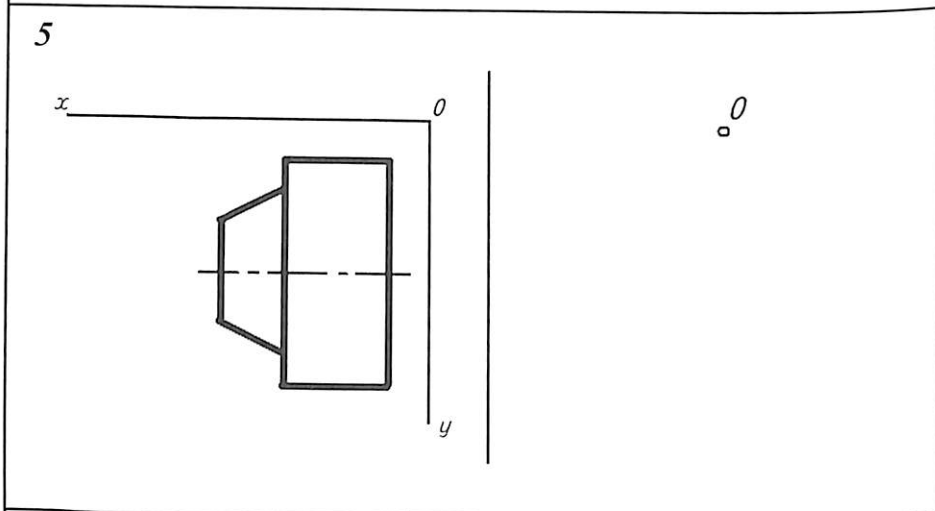
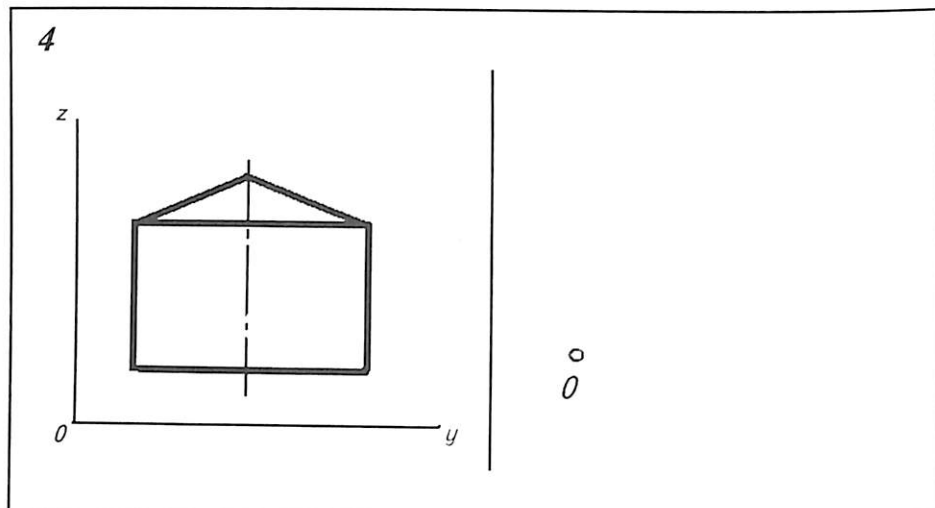
9-topshiriq — «Tekis shaklning izometrik proyeksiyasini bajarish» namunasi



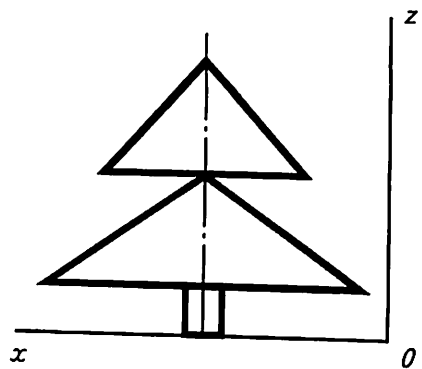
9-topshiriq variantlari





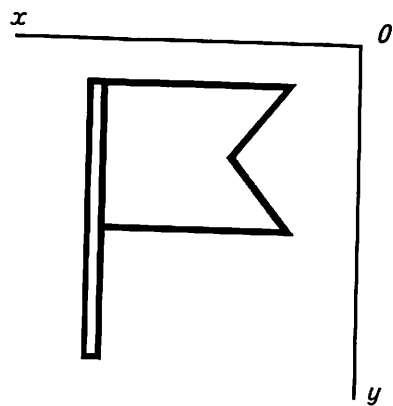


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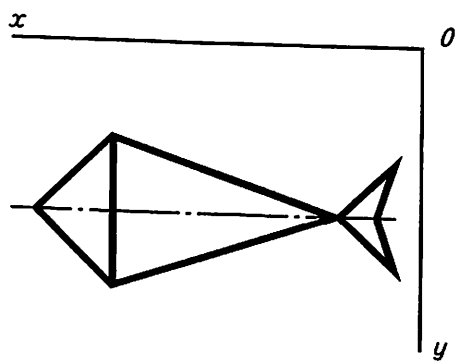
• 0

11



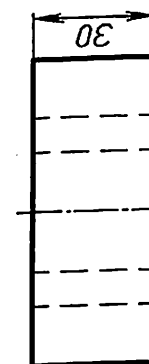
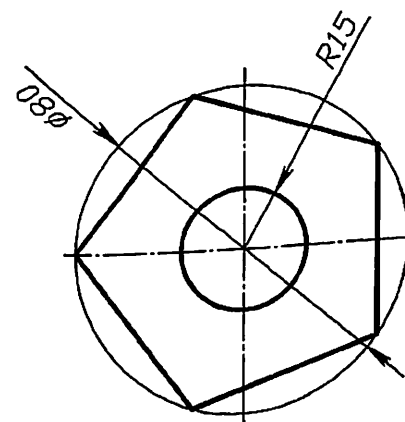
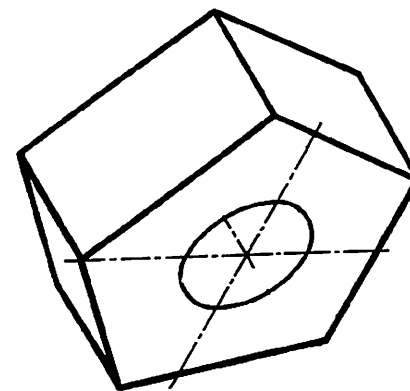
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12



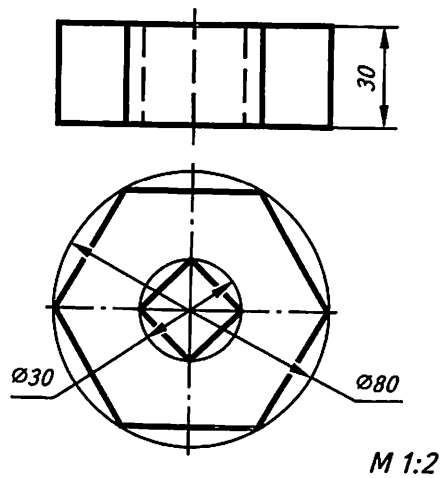
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10-topshiriq – «Geometrik shaklli detalning izometrik proyeksiyasini bajarish» namunasi

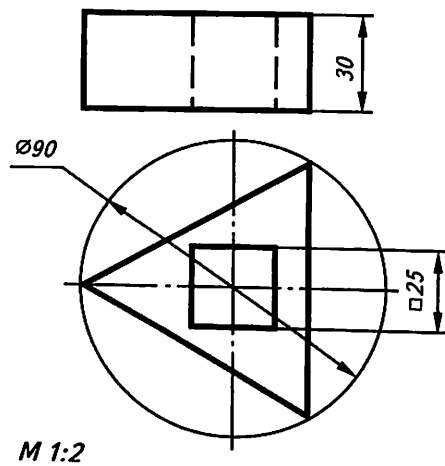


# 10-topshiriq variantlari

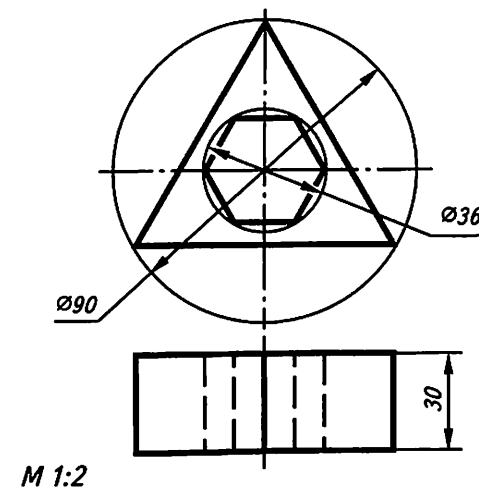
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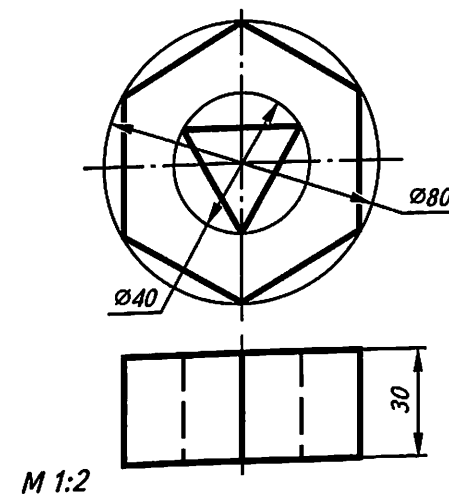
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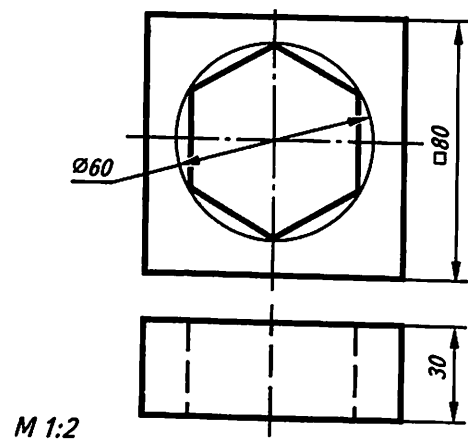
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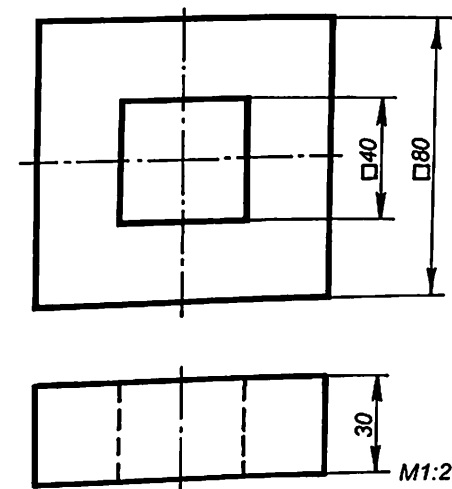
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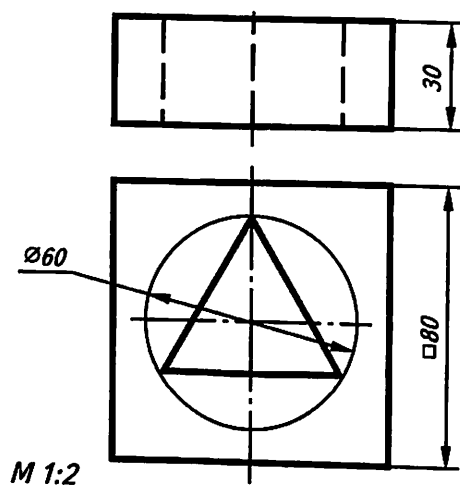
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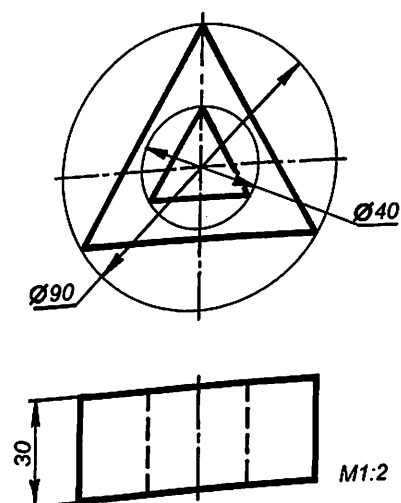
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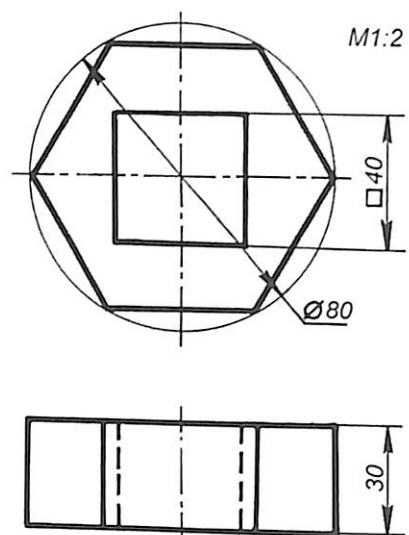
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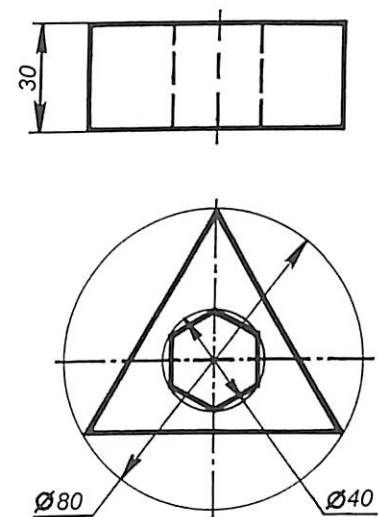
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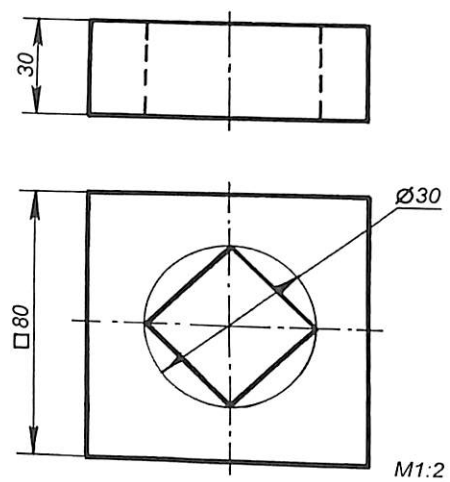
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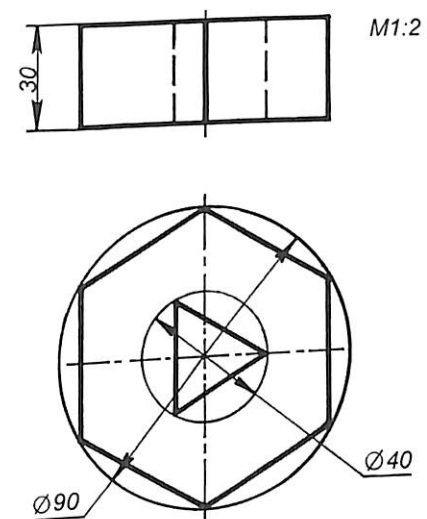
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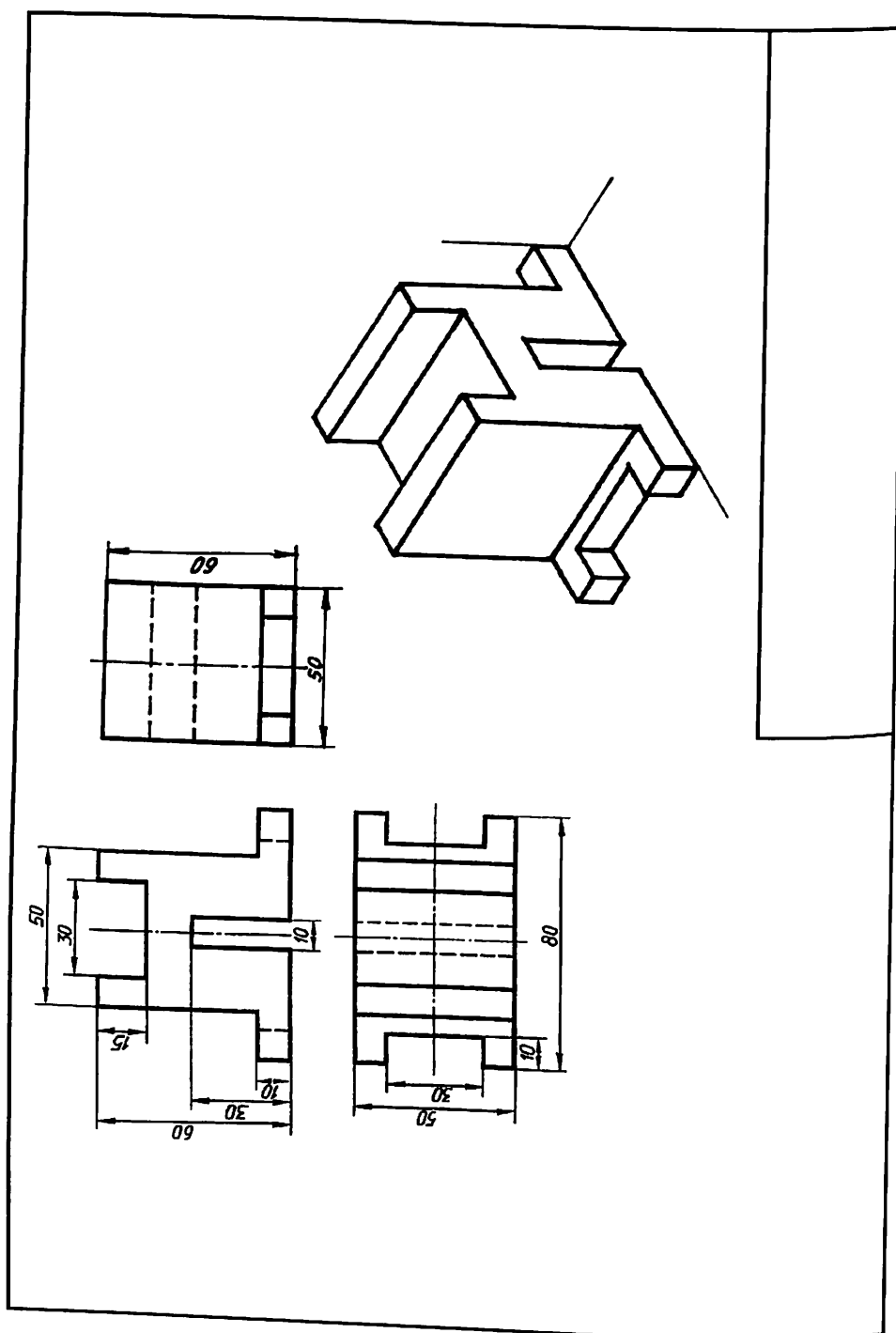
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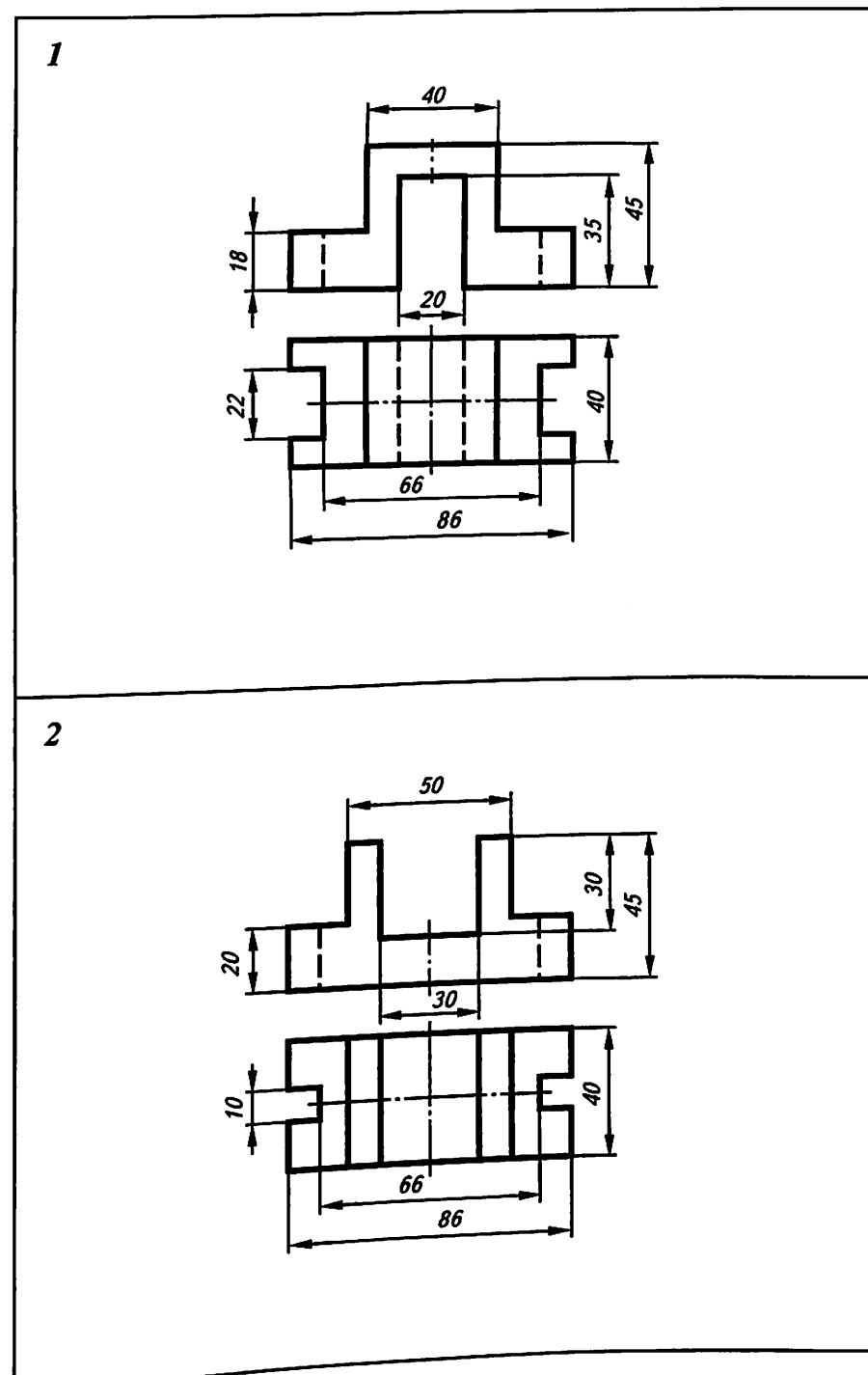
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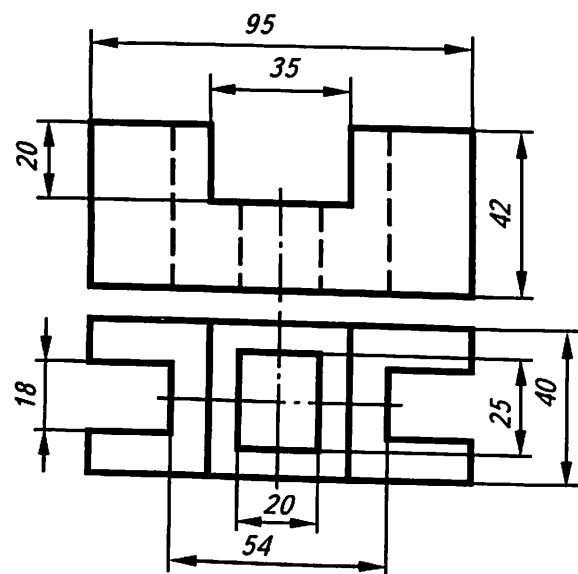
**11-topshiriq — «Detalning izometrik proyeksiyasini bajarish»  
namunasi**



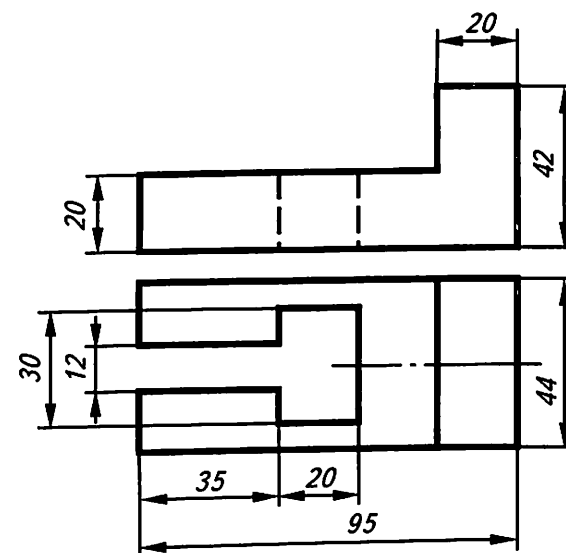
**11-topshiriq variantlari**



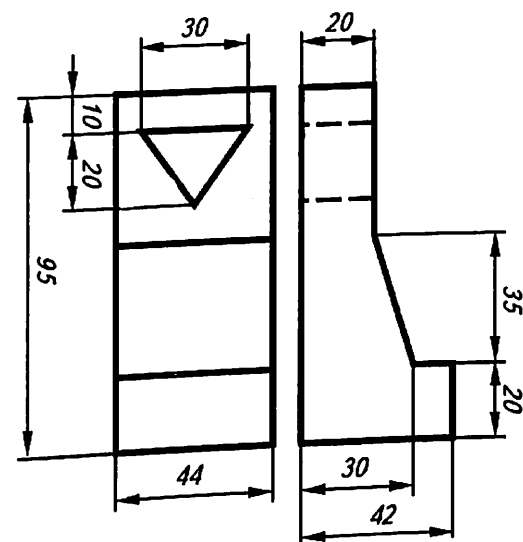
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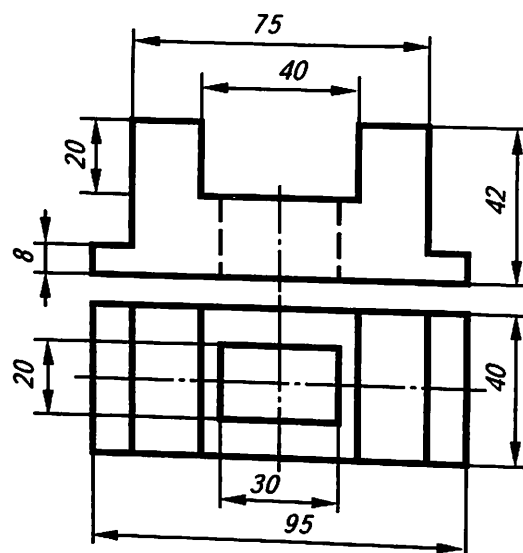
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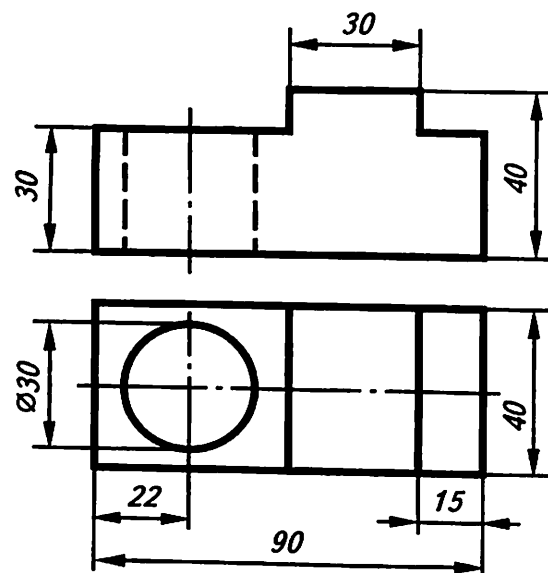
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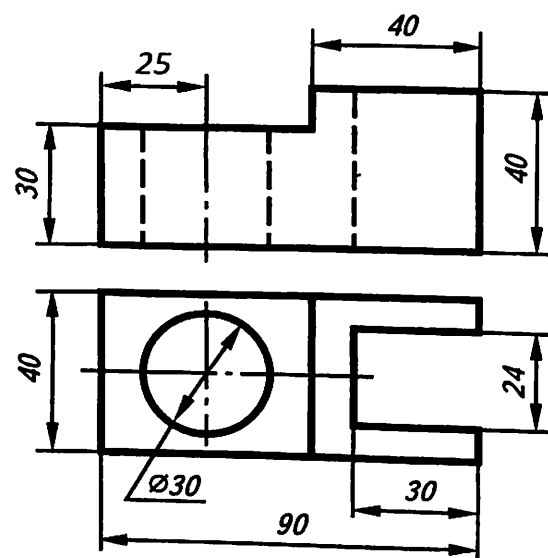
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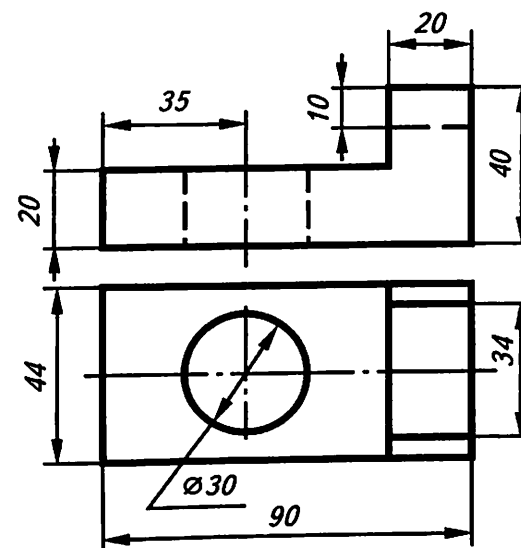
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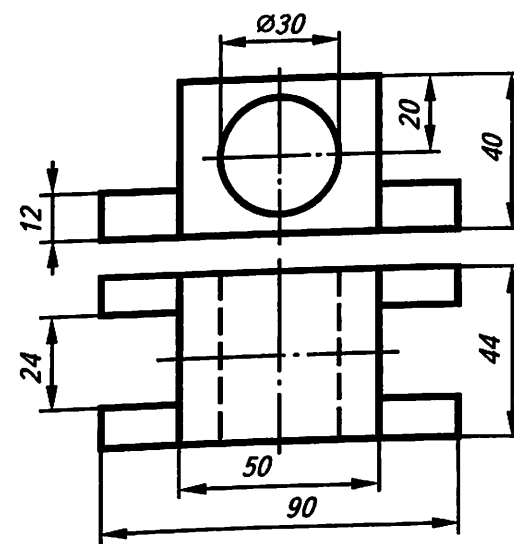
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9

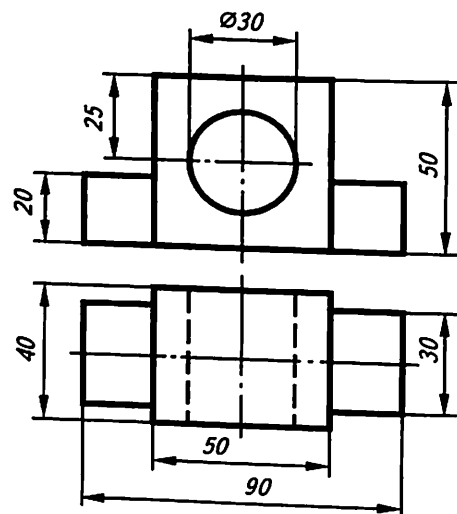


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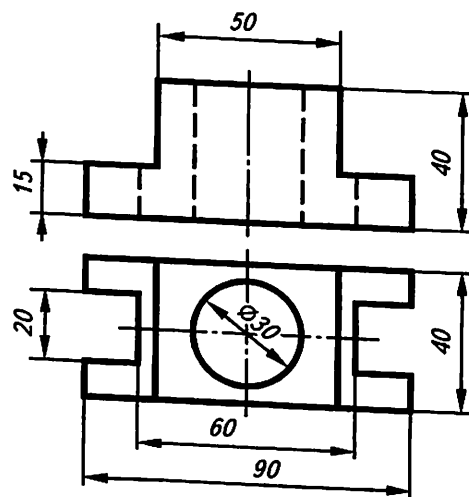




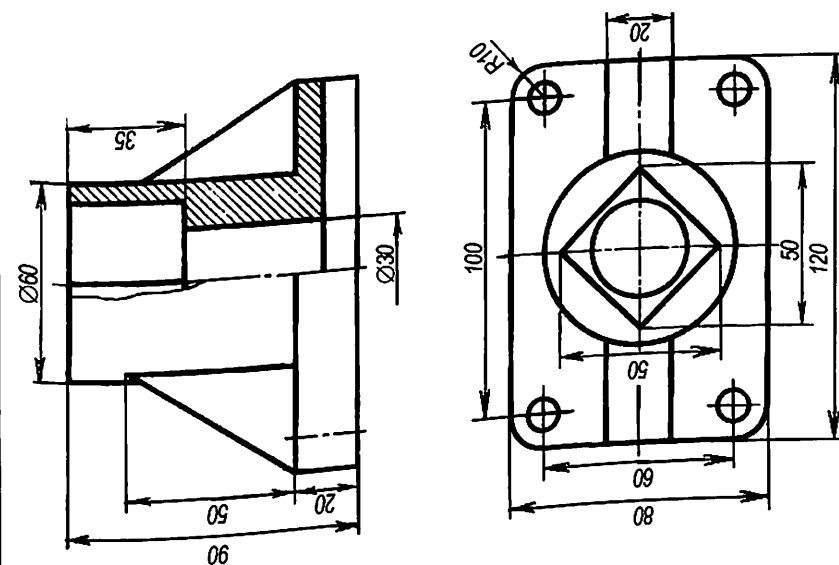
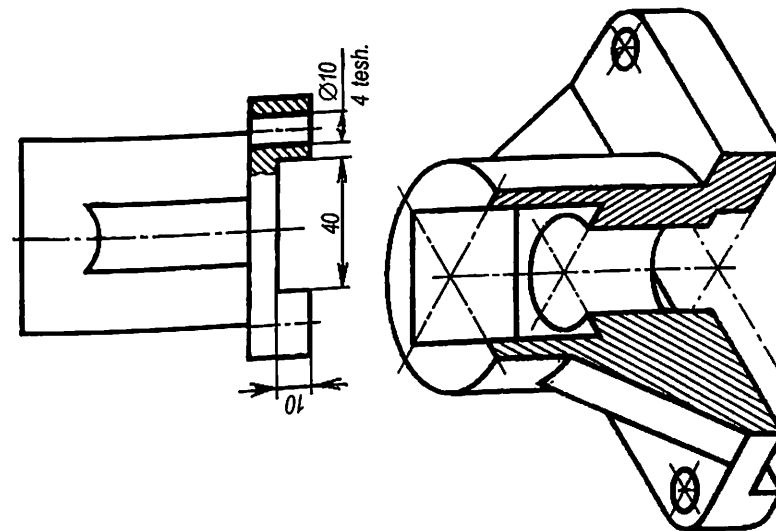
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12

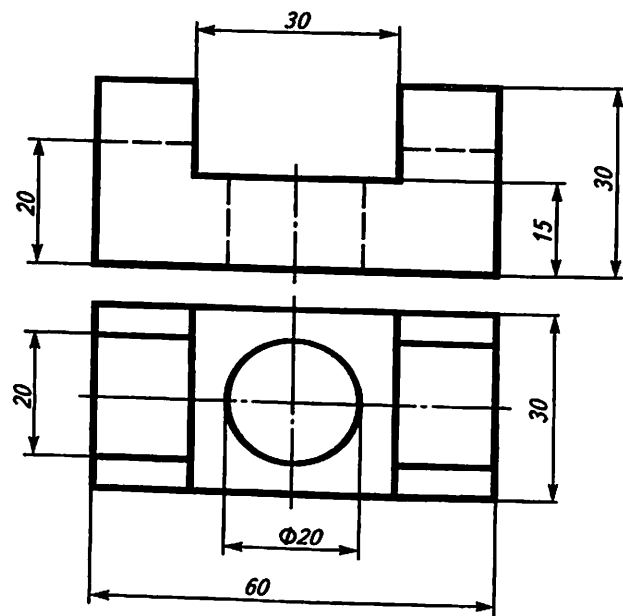


**12-topshiriq** – «Berilgan ikkita proyeksiyaga ko'ra yetishmovchi proyeksiyani topish, qirqim va izometrik proyeksiyani bajarish» namunasi

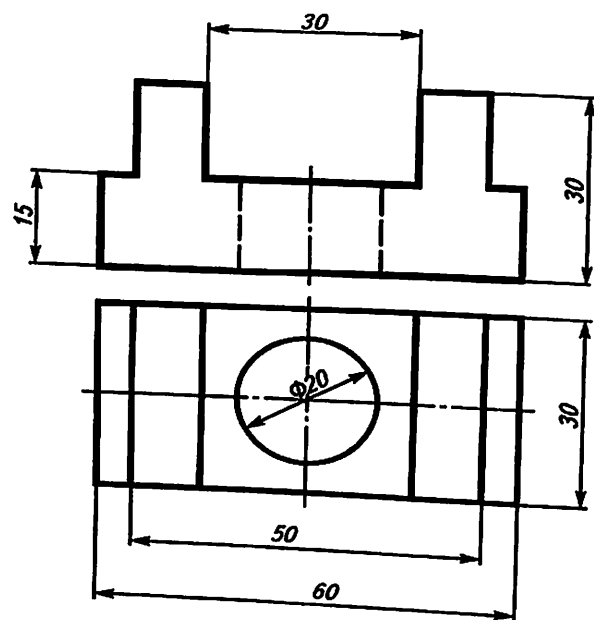


# 12-topshiriq variantlari

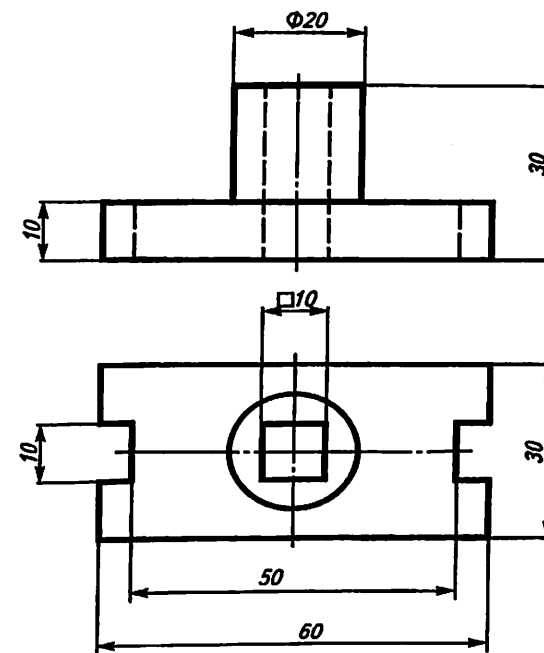
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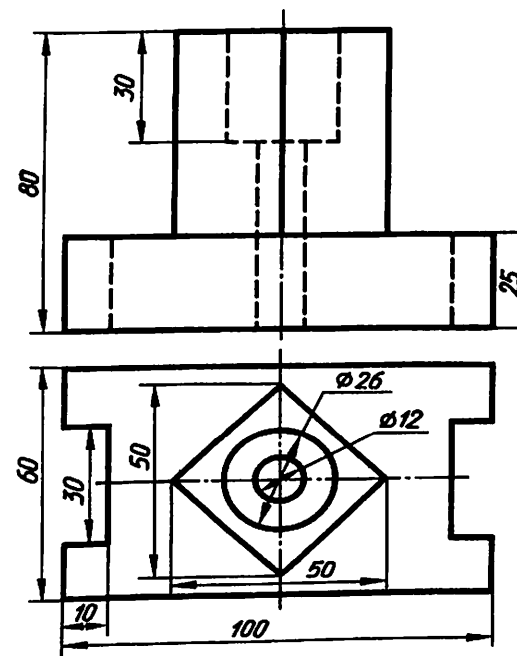
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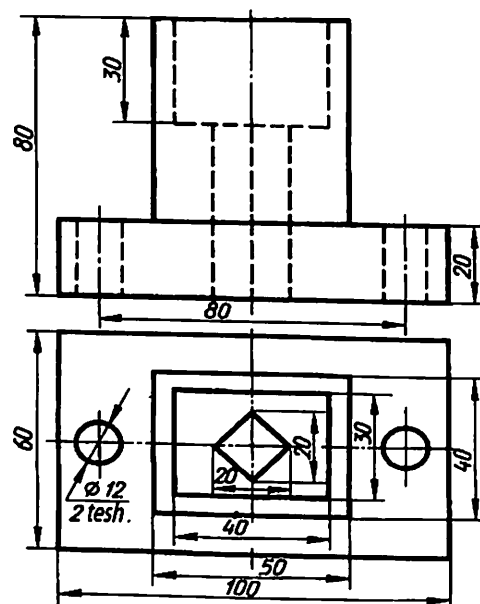
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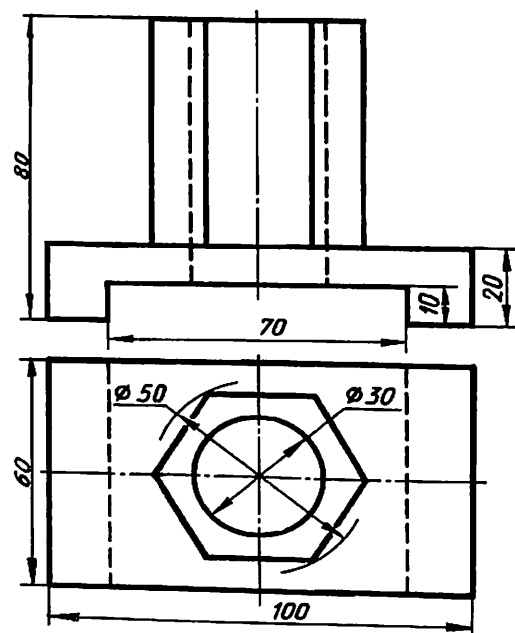
4



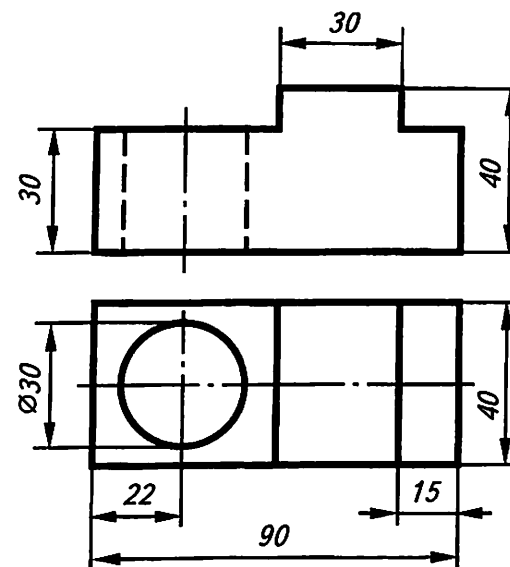
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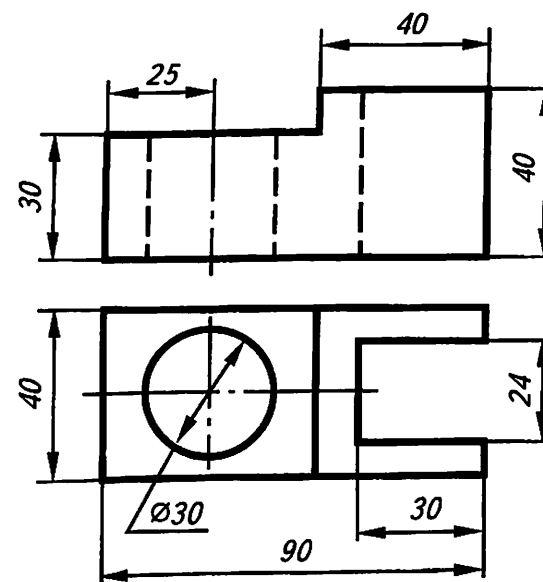
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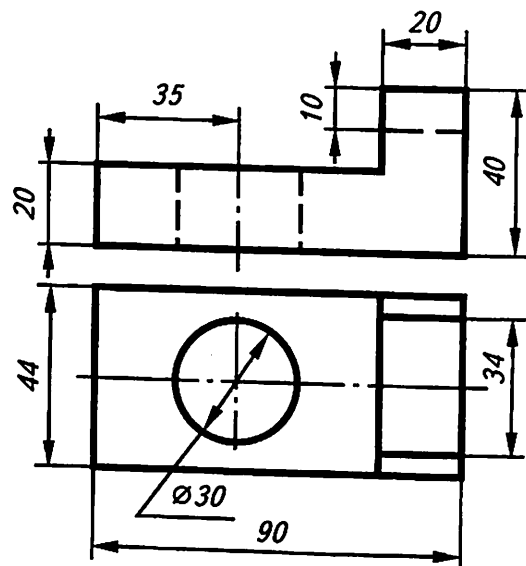
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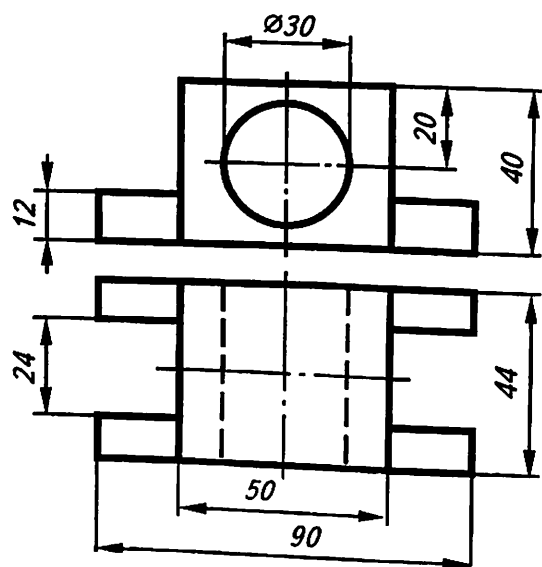
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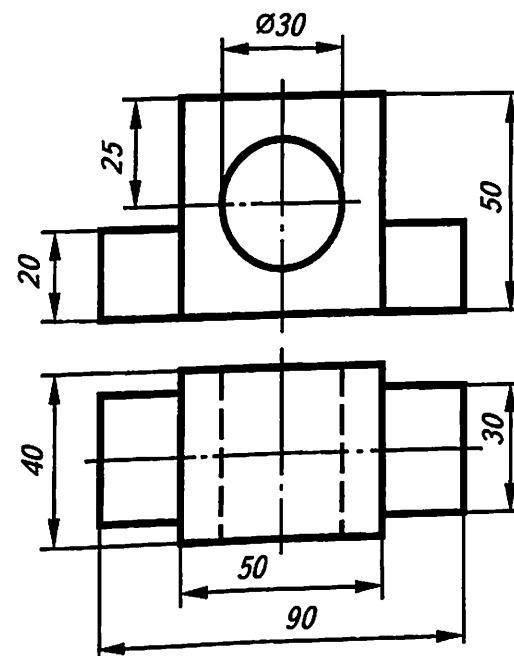
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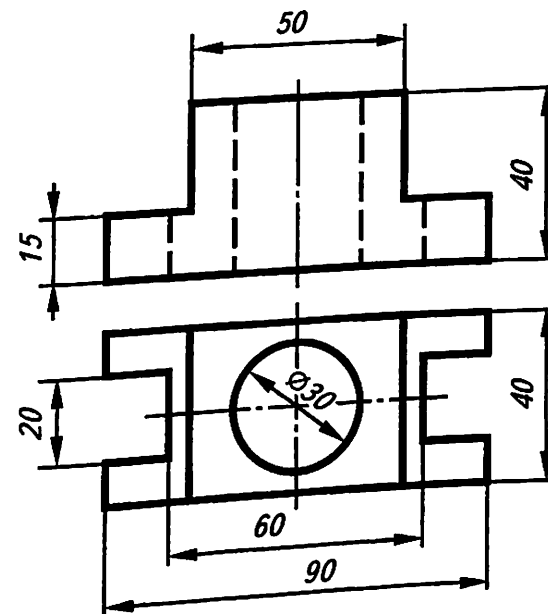
10



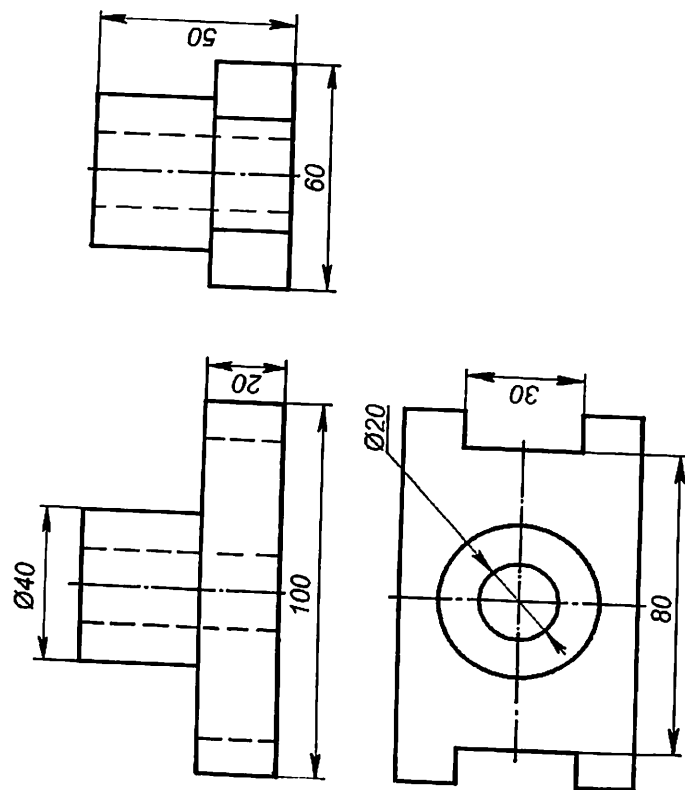
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12

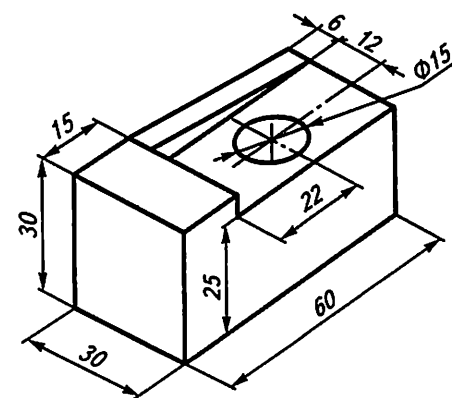


13-topshiriq – «Detailning yaqqol tasviri bo'yicha eskizini bajarish» namunasi

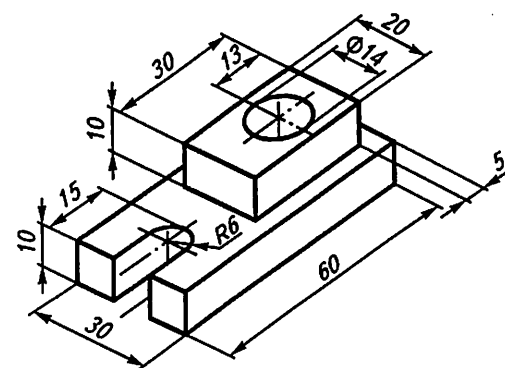


13-topshiriq variantlari

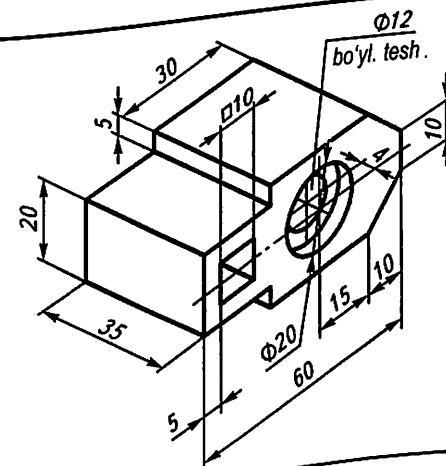
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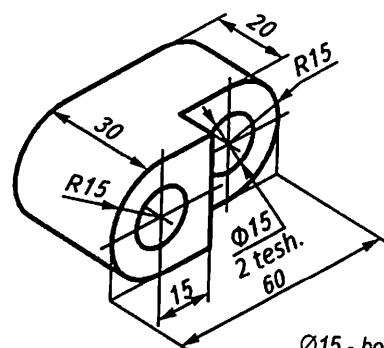
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3

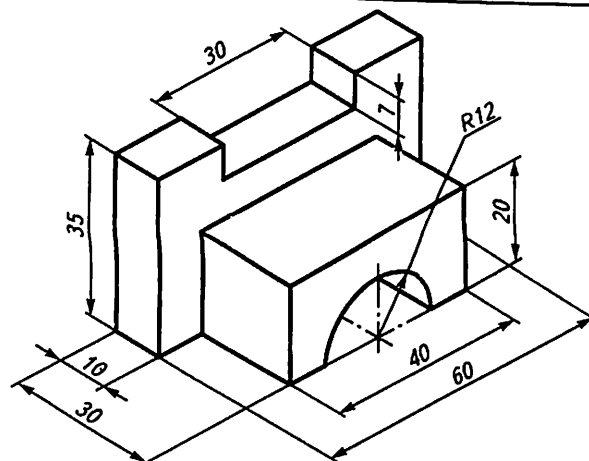


4

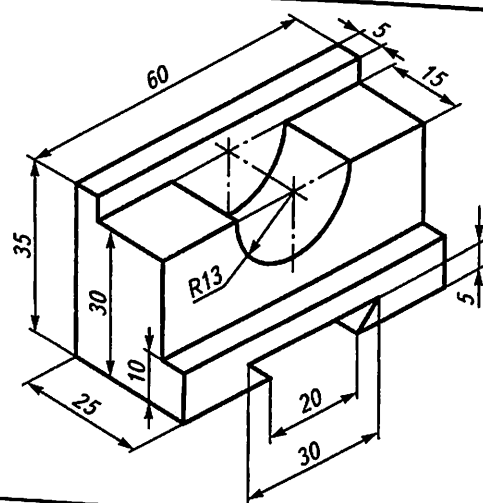


Ø15 - bo'yl. tesh.

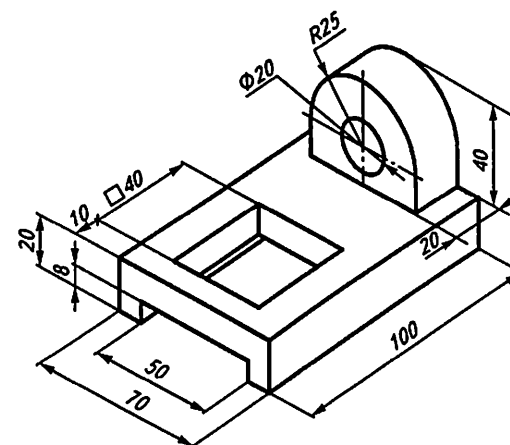
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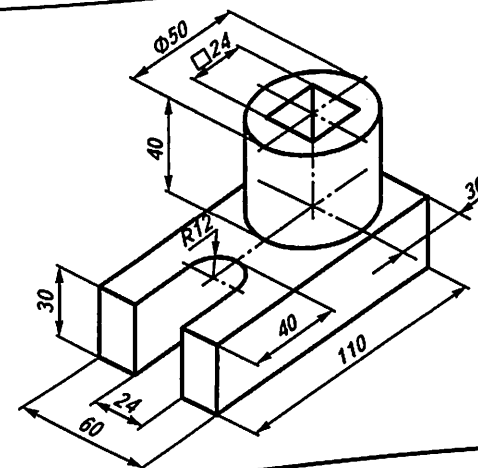
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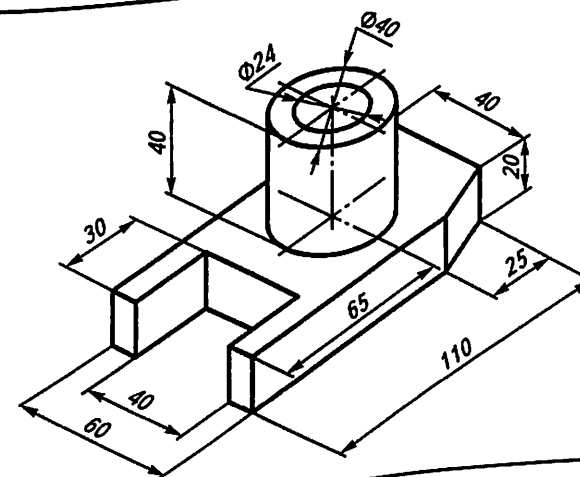
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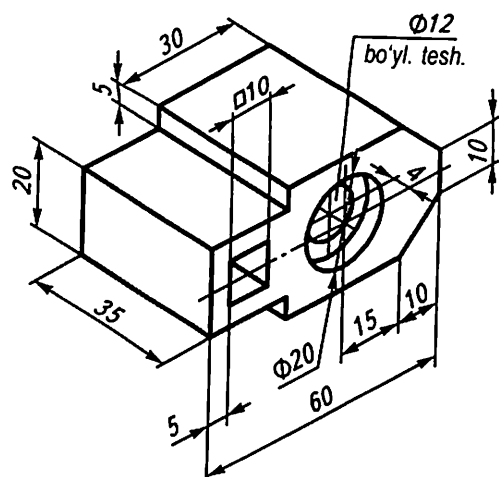
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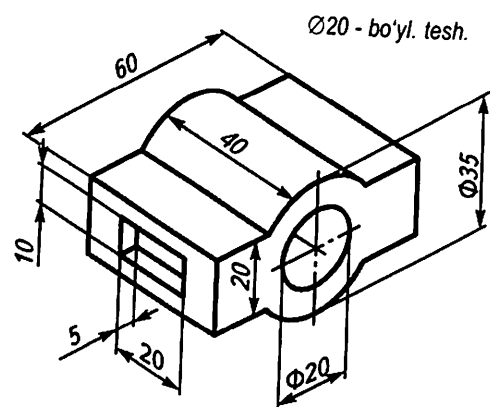
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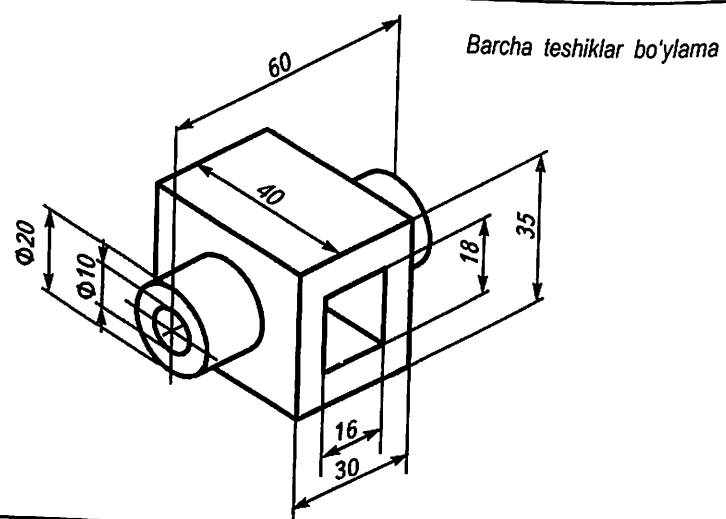
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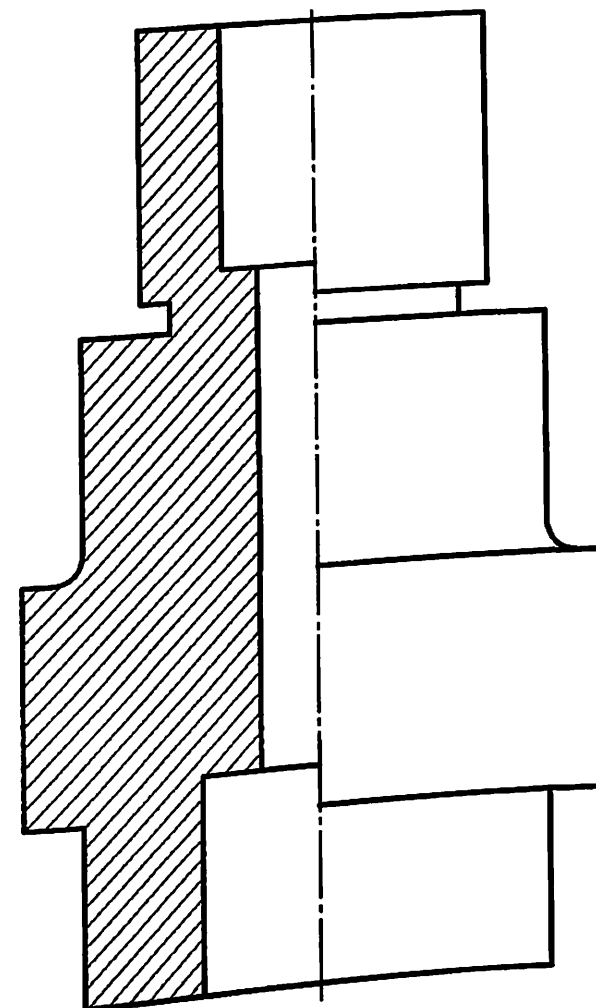
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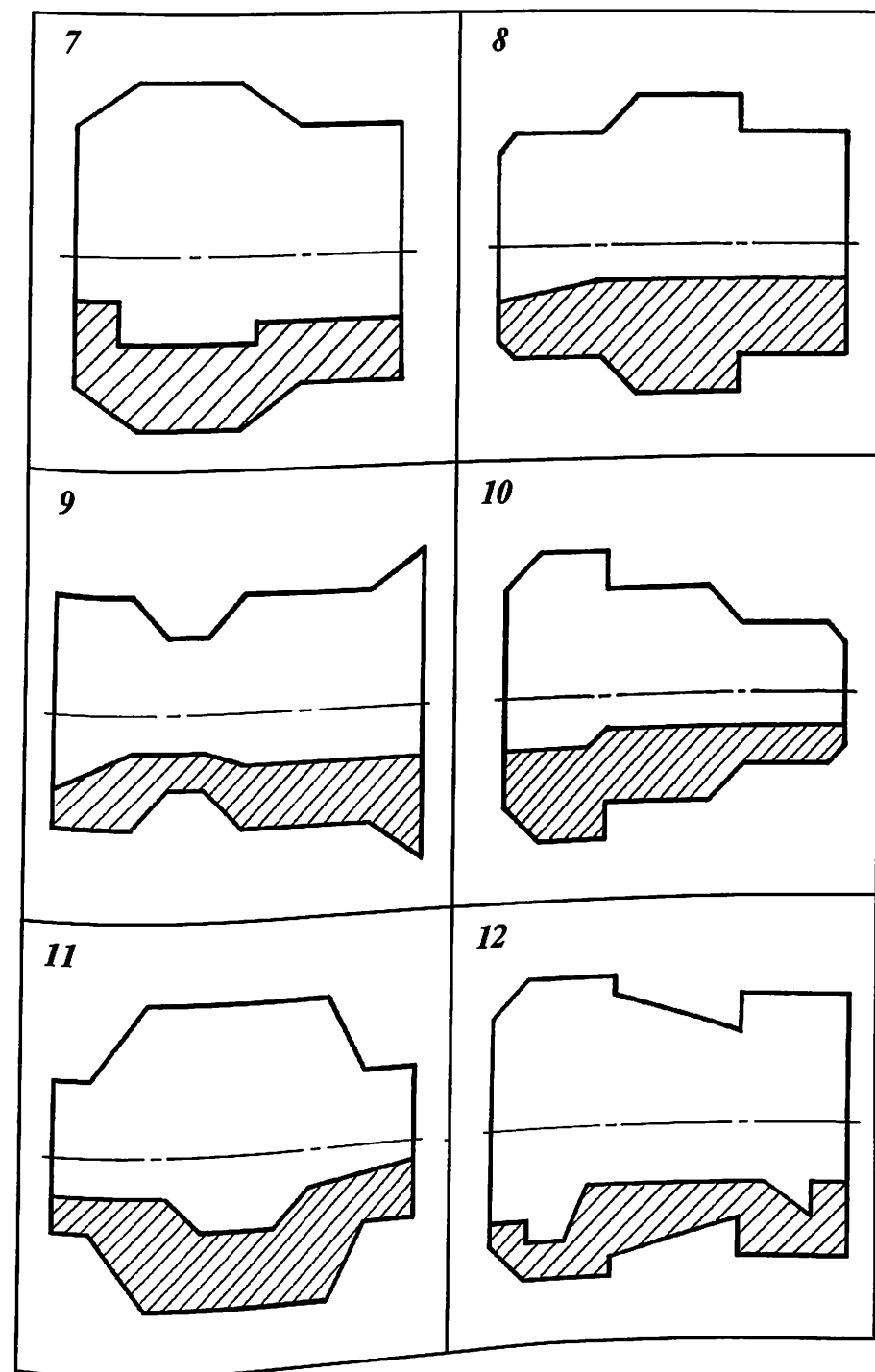
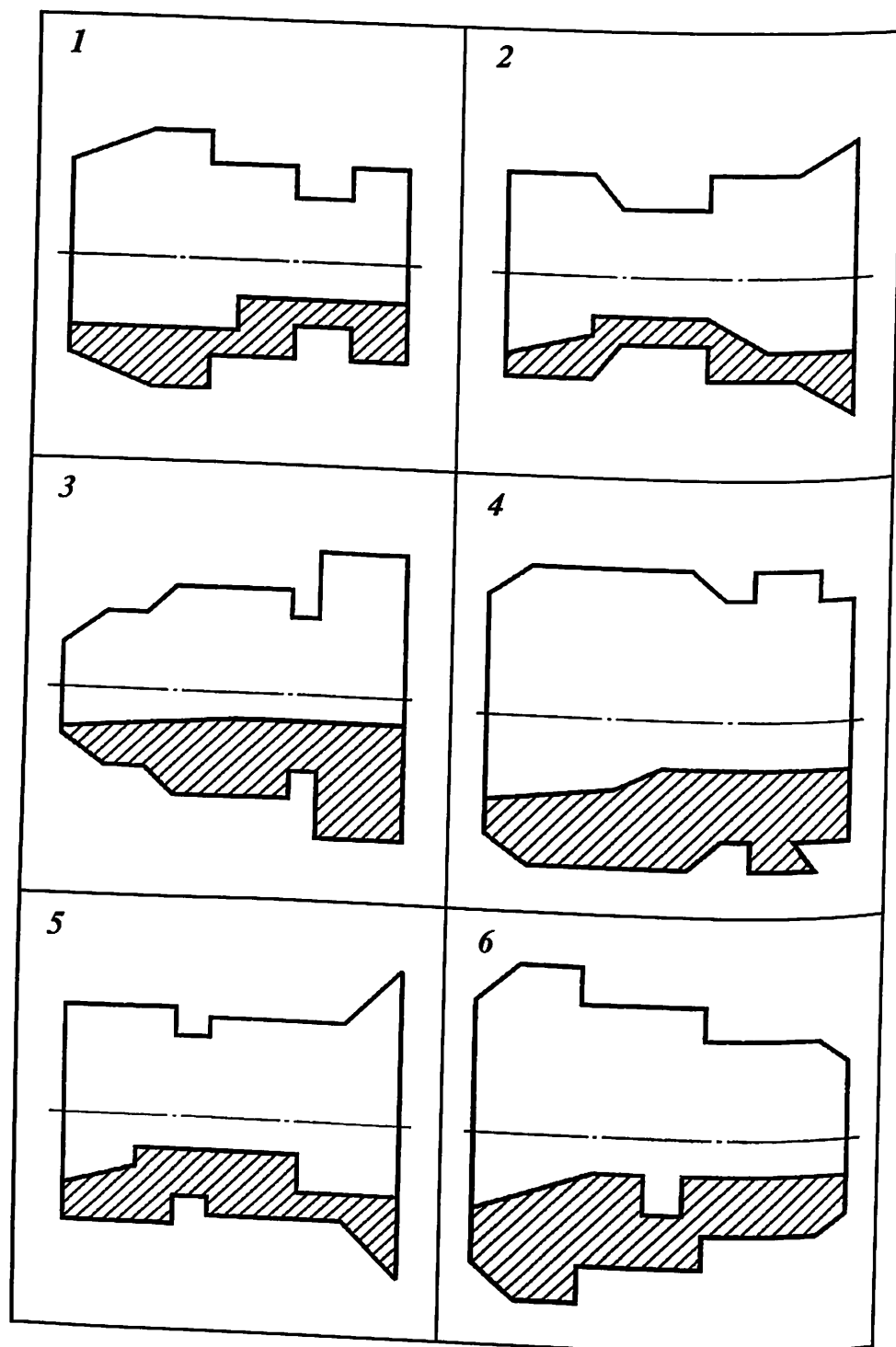
12



14-topshiriq — «Ko'rinishning yarmi bilan qirqimning yarmini birlashtirishdagi yetishmovchi chiziqlarini bajarish» namunasi

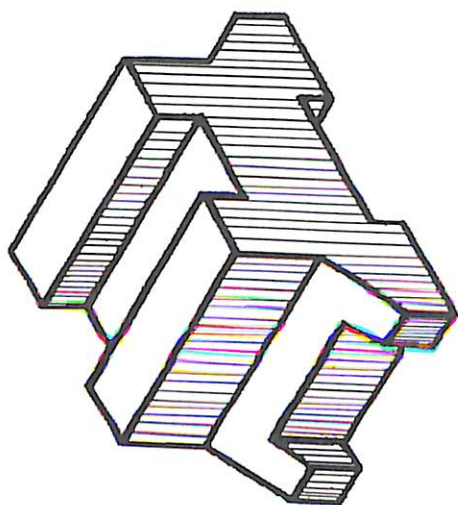
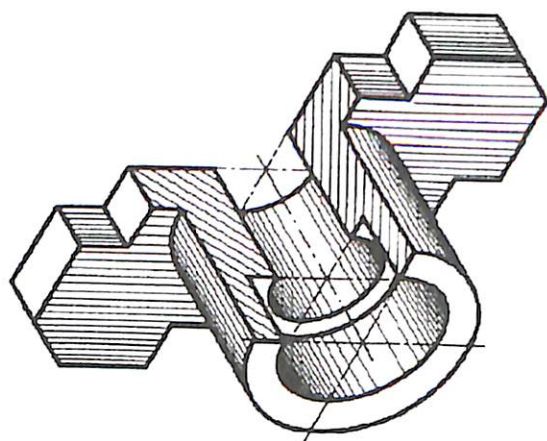


14-topshiriq variantlari



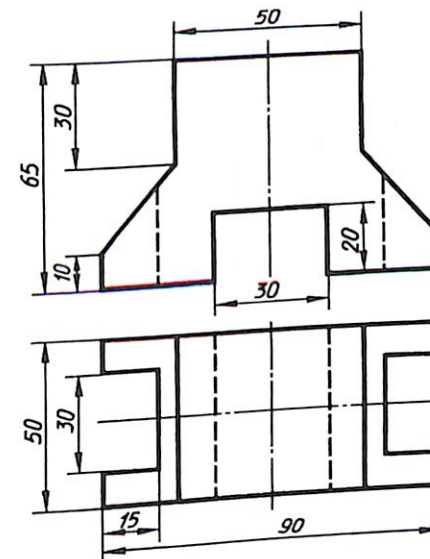


15-topshiriq – «Detalning ikkita ko‘rinishiga asosan uning  
texnik chizmasini bajarish» namunasi

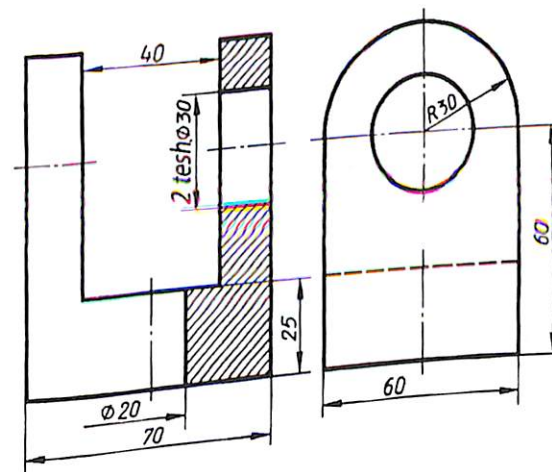


15-topshiriq variantlari

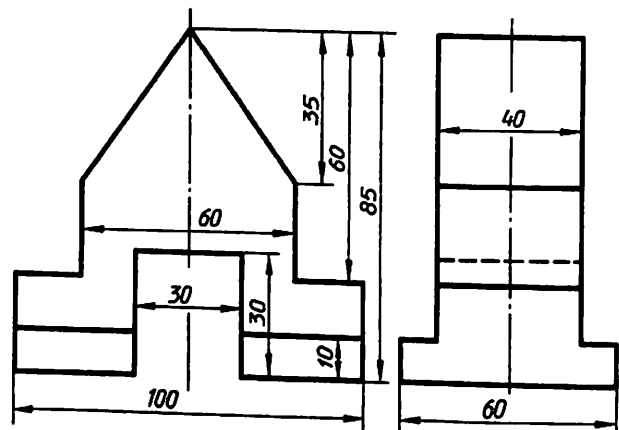
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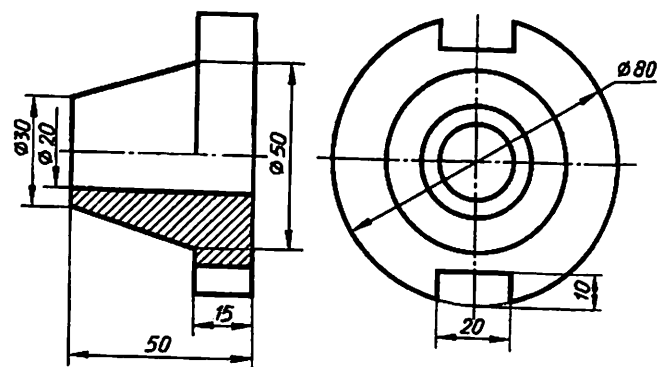
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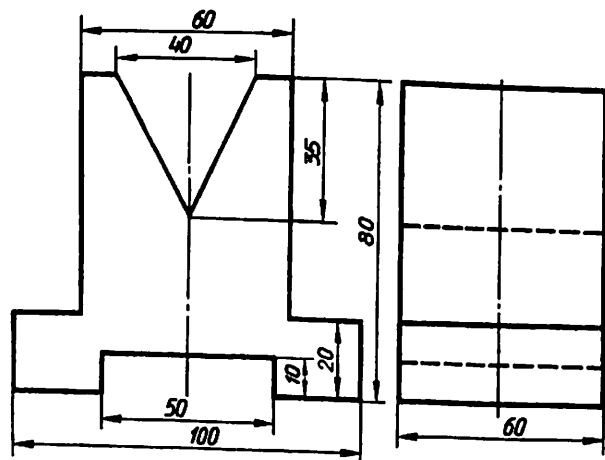
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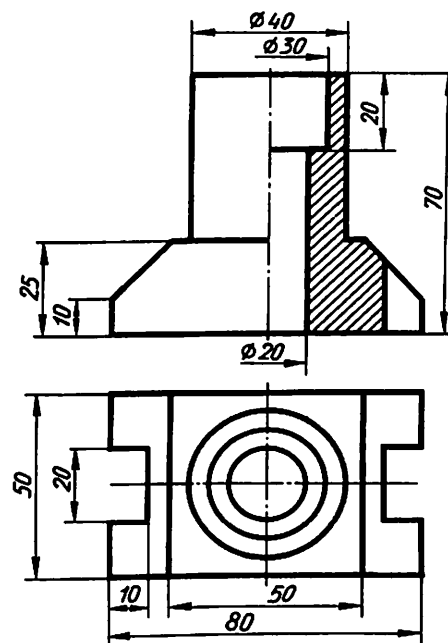
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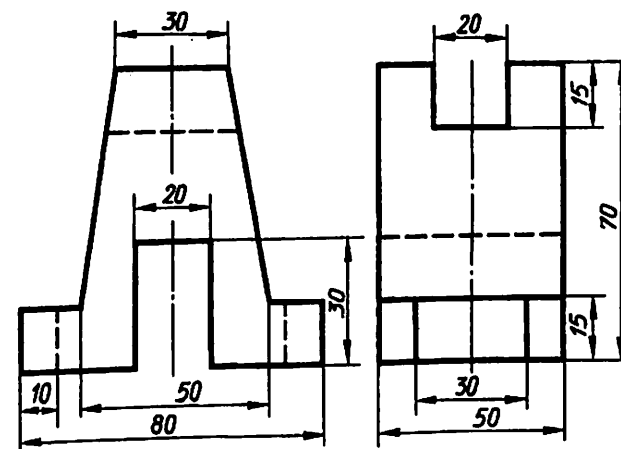
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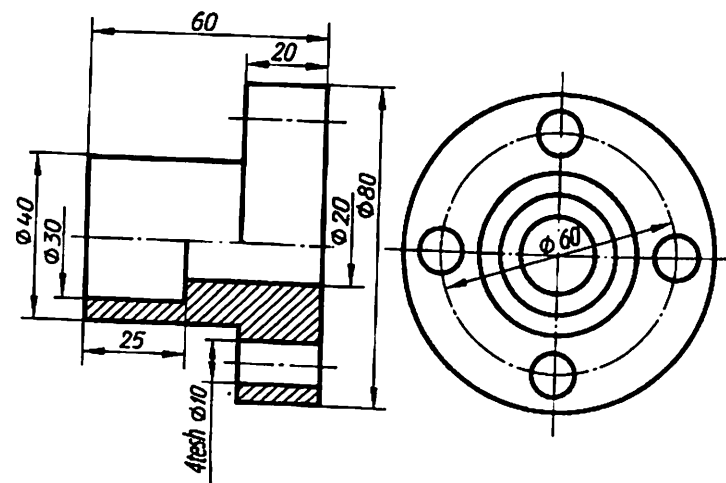
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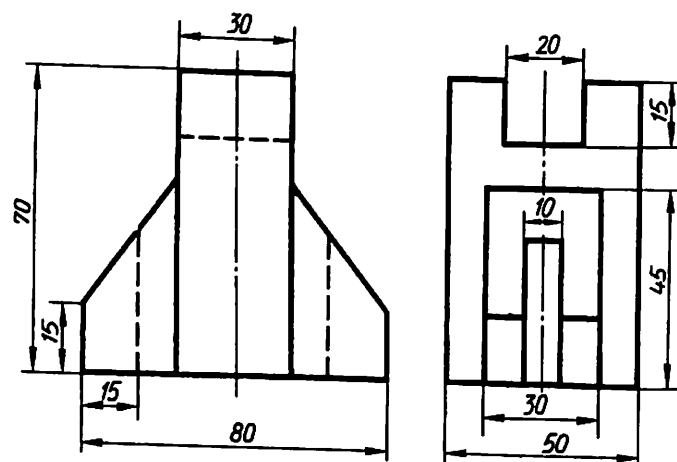
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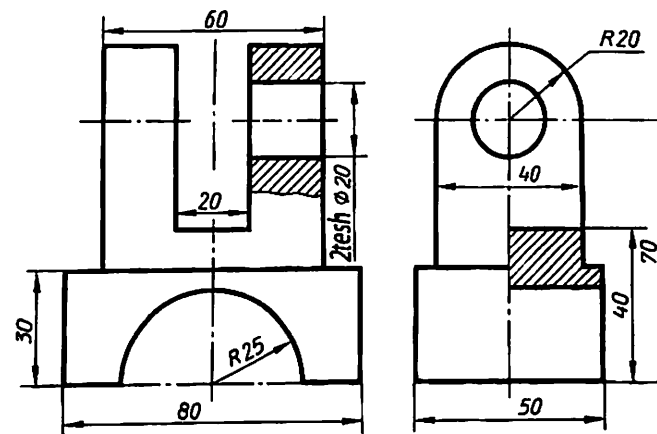
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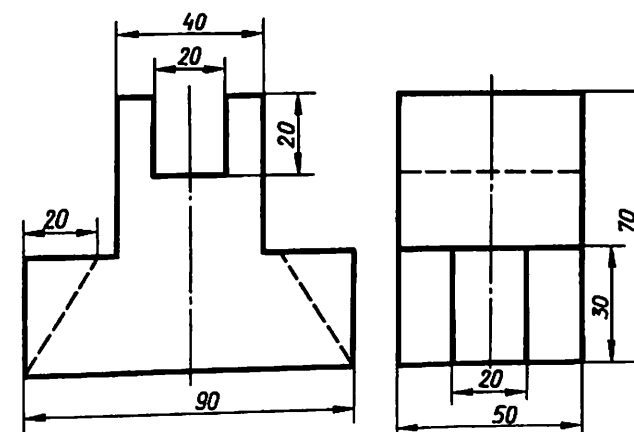
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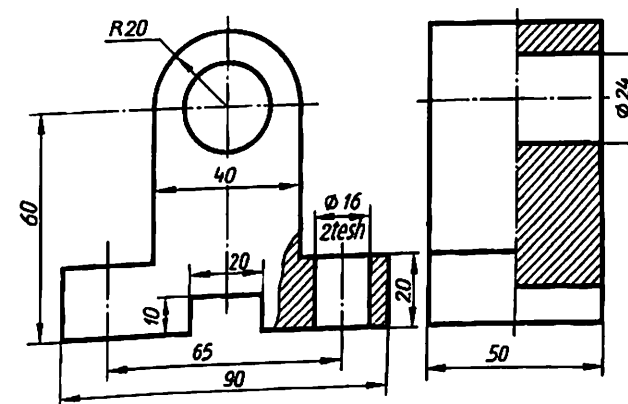
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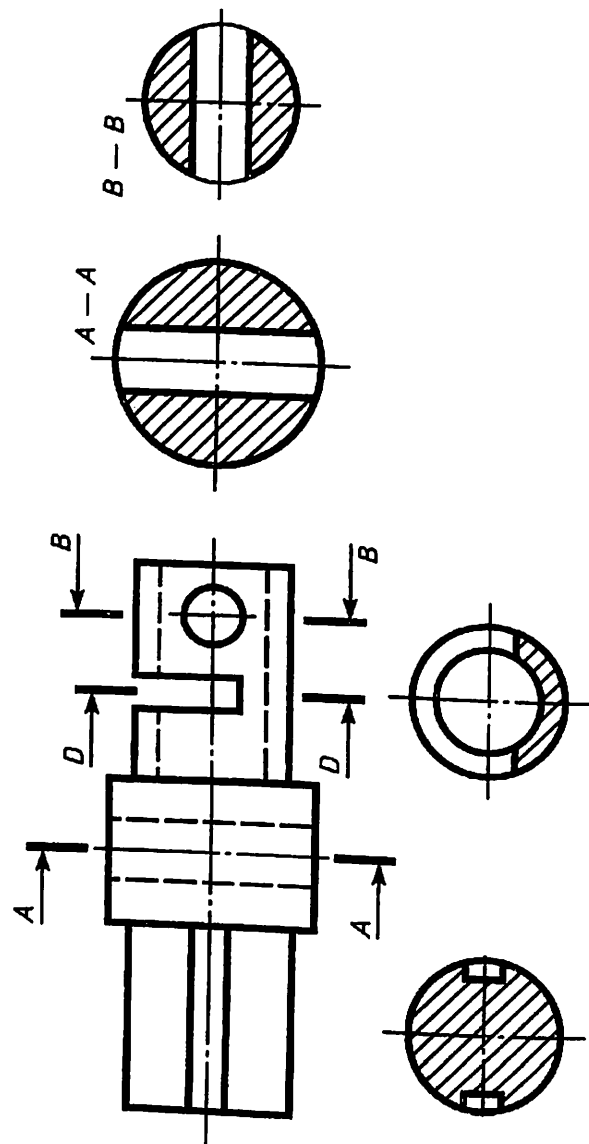
11



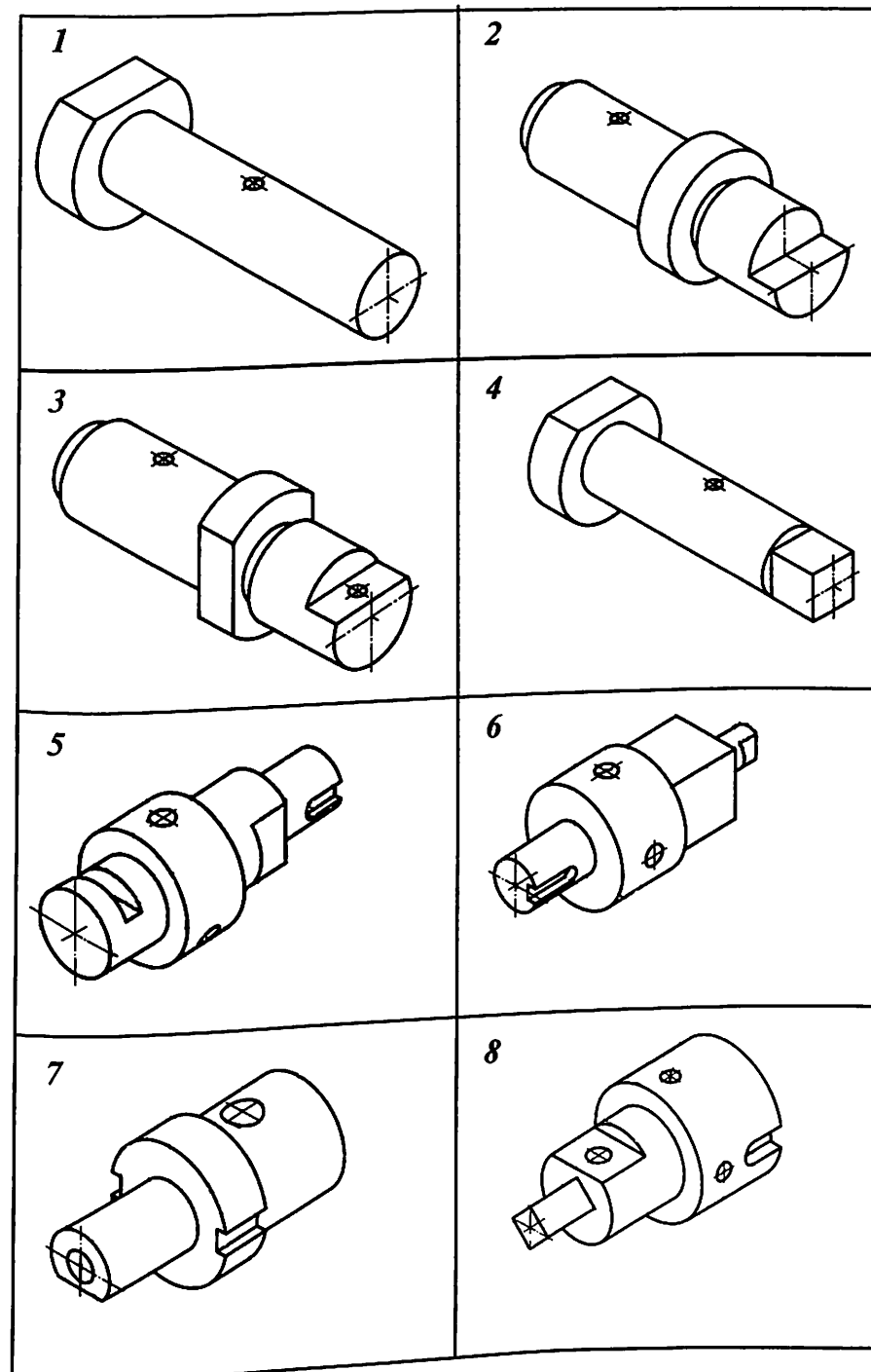
12



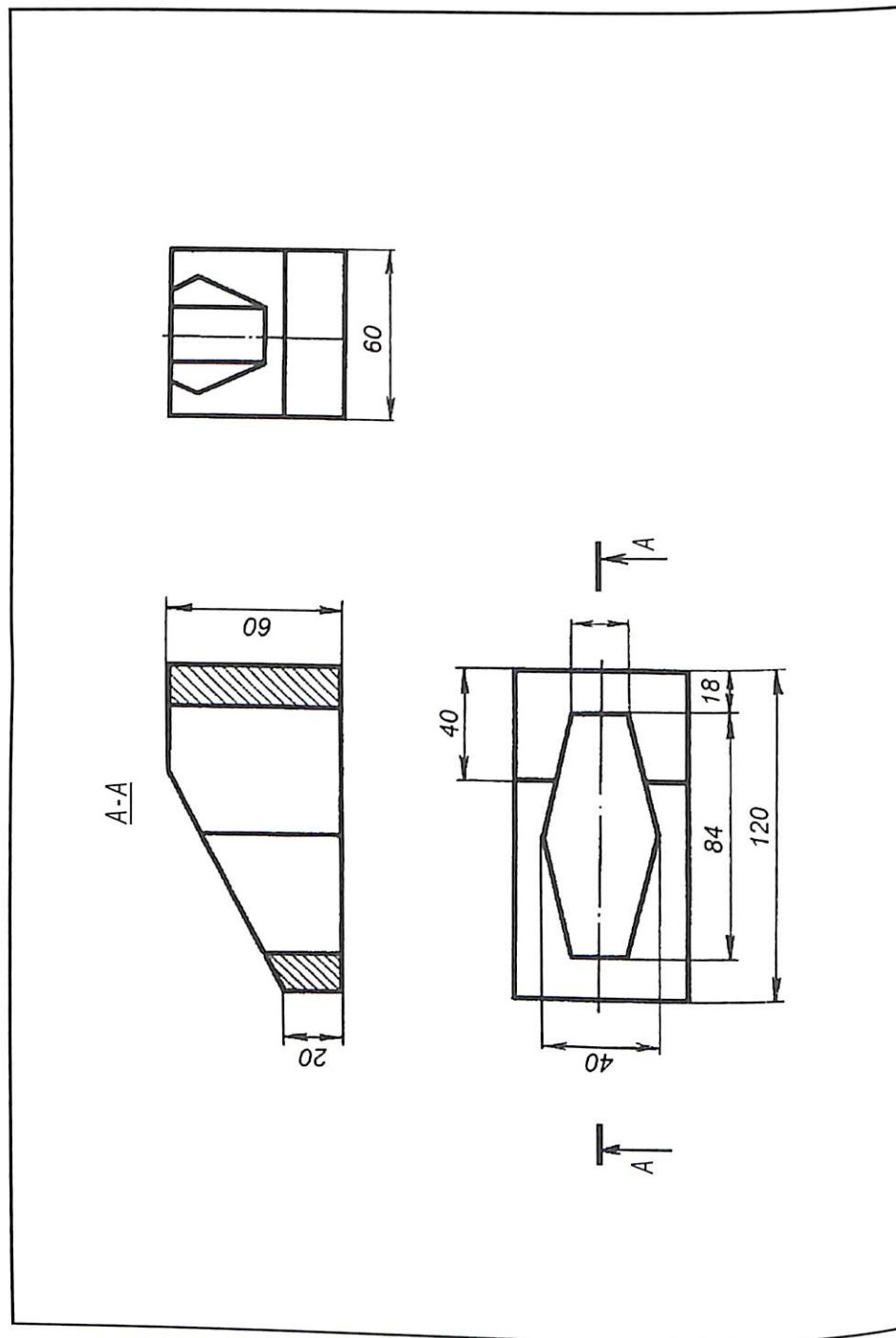
**16-topshiriq** – «Yaqqol tasvir bo'yicha tarkibida kesim tasvirlangan detal chizmasini bajarish» namunasi



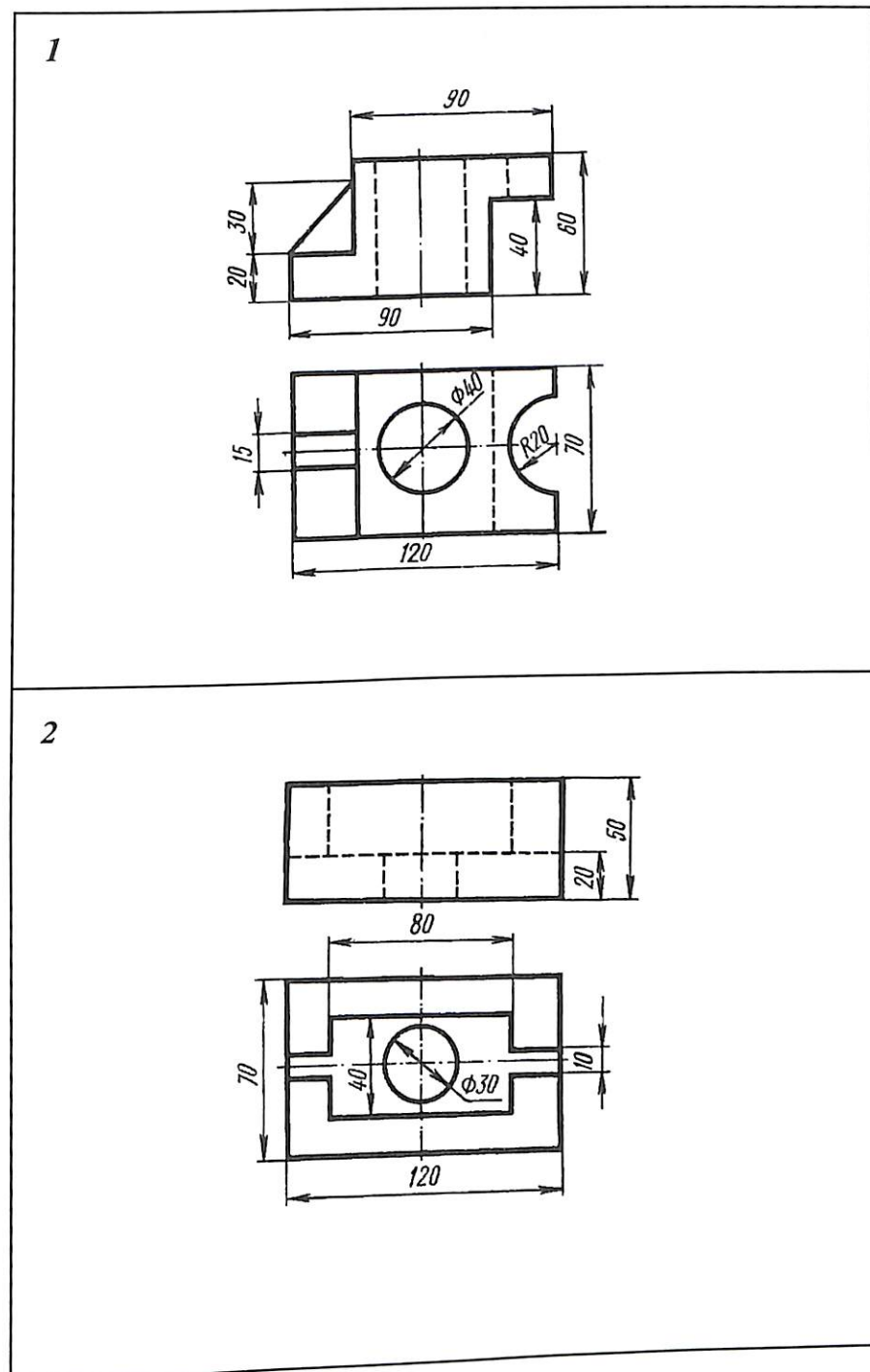
**16-topshiriq variantlari**



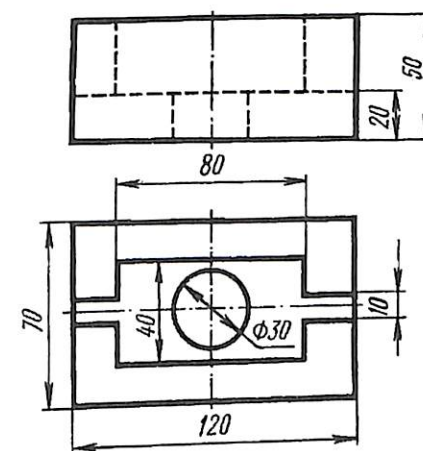
17-topshiriq — «Oddiy qirgim chizmasini bajarish»  
namunasi



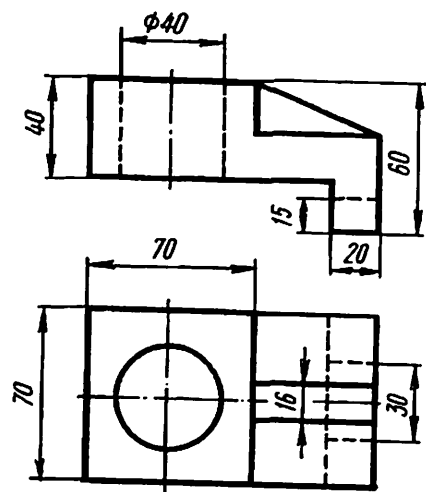
17-topshiriq variantlari



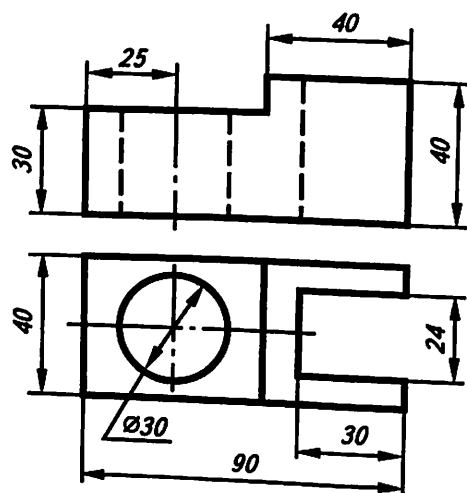
2



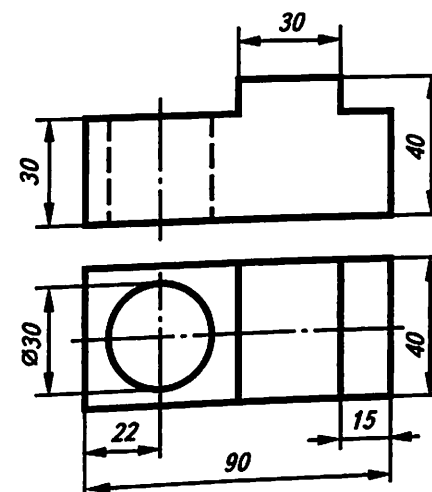
3



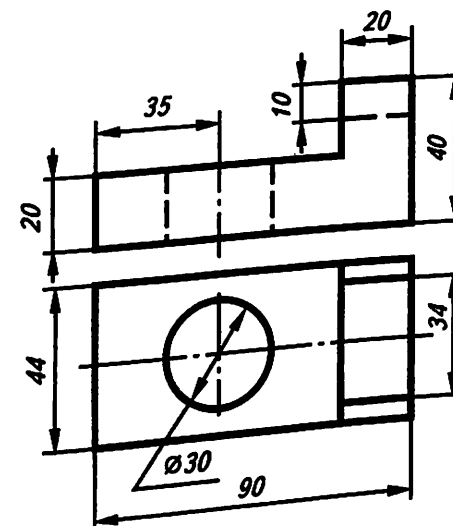
4



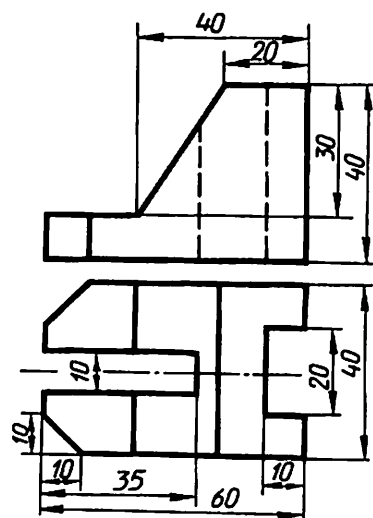
5



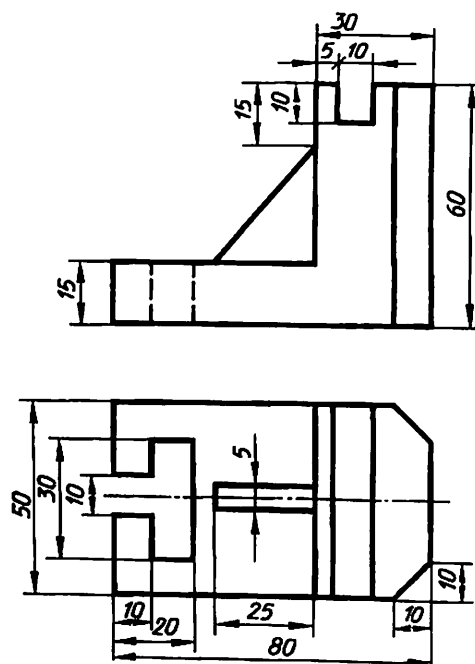
6



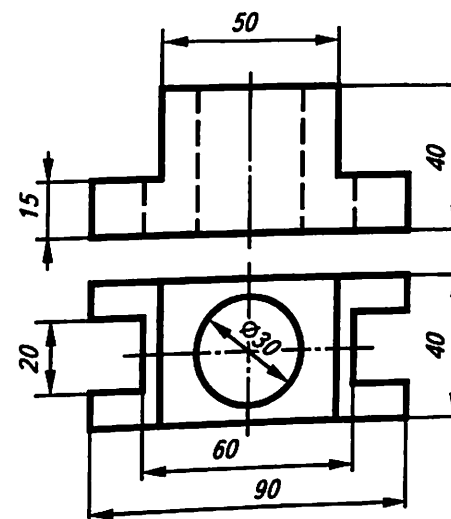
7



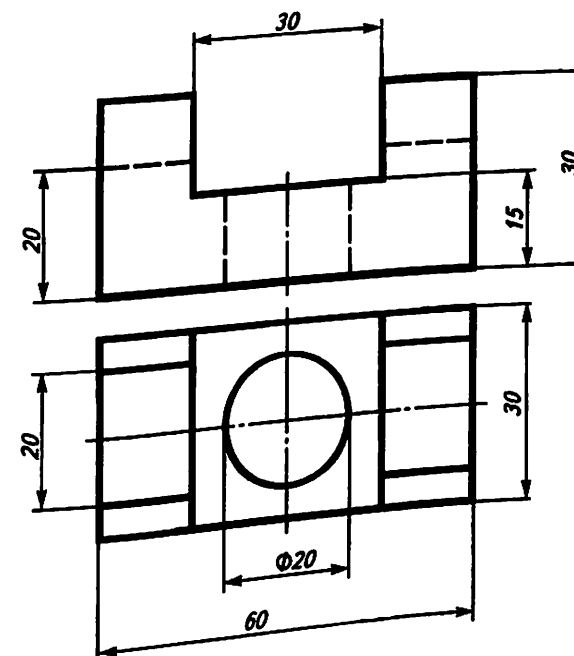
8



9



10



The image displays two orthographic views of a mechanical component. The top view is a front elevation showing a stepped profile. It has a total width of 60 and a total height of 30. The left side has a vertical edge of height 15. The top surface is divided into three sections: a central rectangular section of width 30 and height 15, and two side sections of height 15. The bottom view is a top plan view showing a rectangular shape with overall dimensions of 60 by 30. It features a central circular hole with a diameter of  $\phi 20$ . The hole is positioned 50 units from the left edge and 30 units from the bottom edge. The plan view is divided into four vertical sections by three lines, with the central section containing the hole.

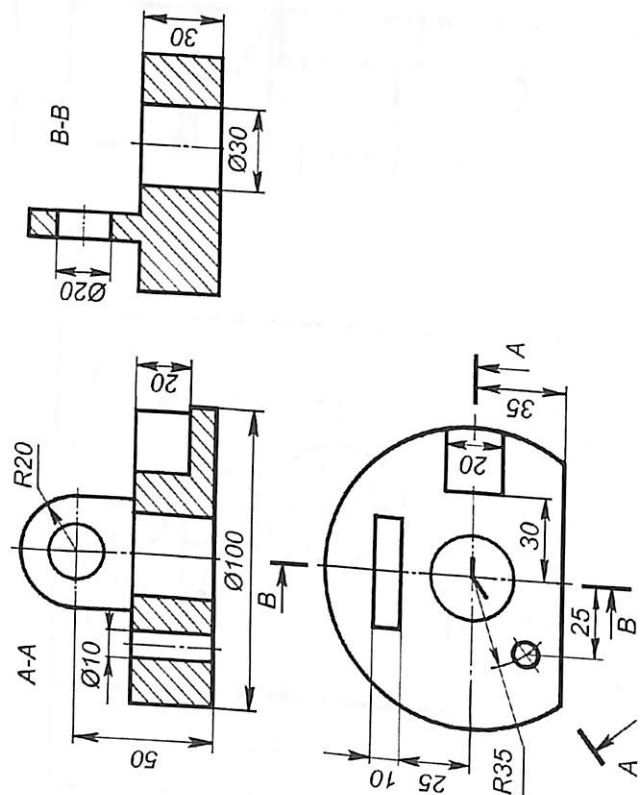
**18-topshiriq – «Murakkab qirqim chizmasini bajarish»  
namunasi (1–6-variantlar uchun)**

A technical drawing of a mechanical part, labeled A-A. The part is a horizontal cylinder with a total diameter of 30. It features a central section with a diameter of 20 and a length of 10. The ends of the part are hatched. The drawing is labeled A-A at the top.

111

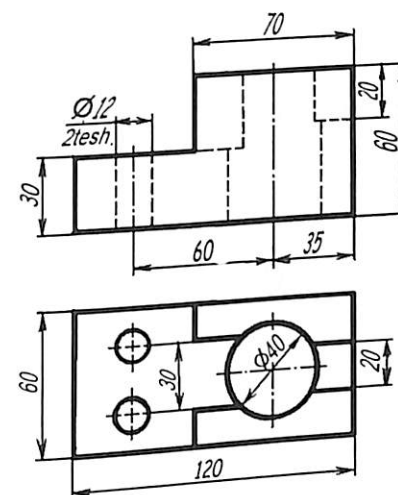


18-topshiriq – «Murakkab qirqim chizmasini bajarish»  
namunasi (7–12-variantlar uchun)

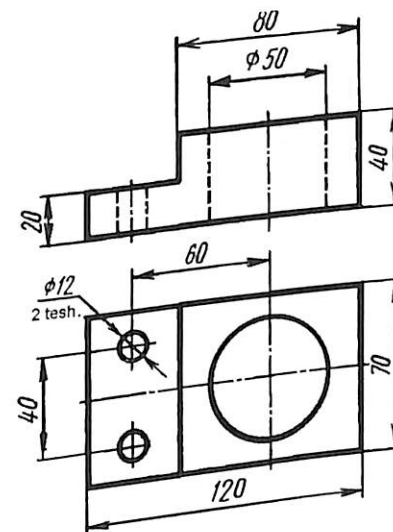


18-topshiriq variantlari

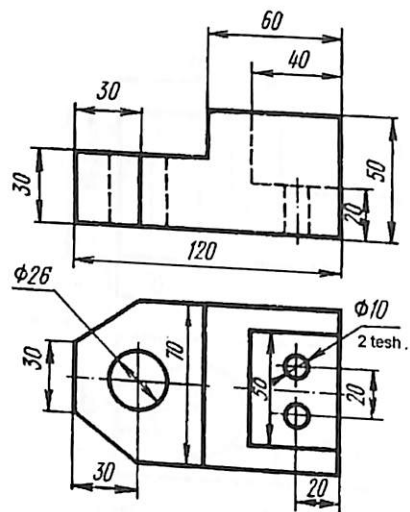
1



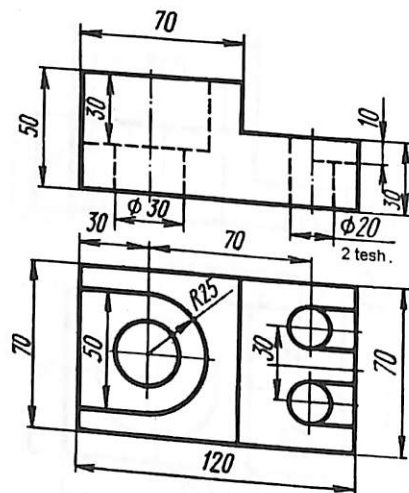
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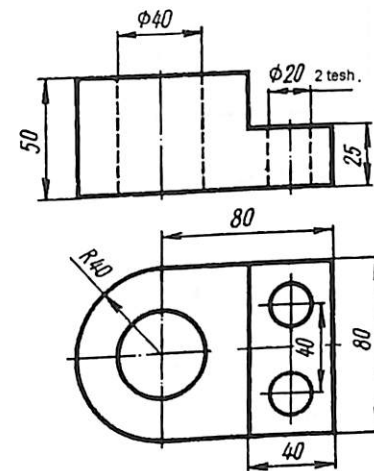
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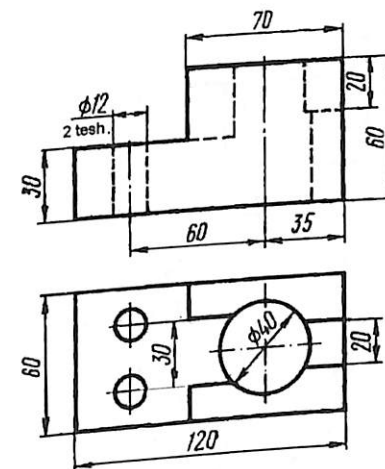
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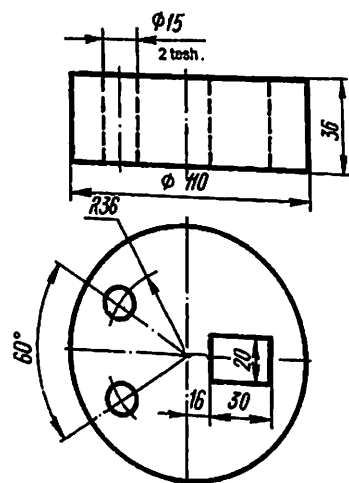
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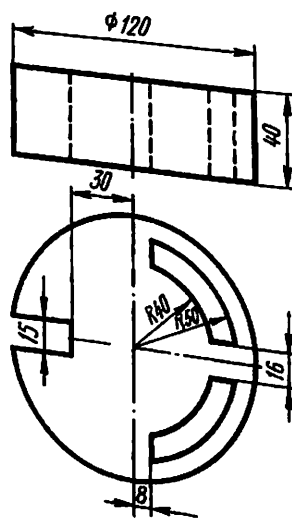
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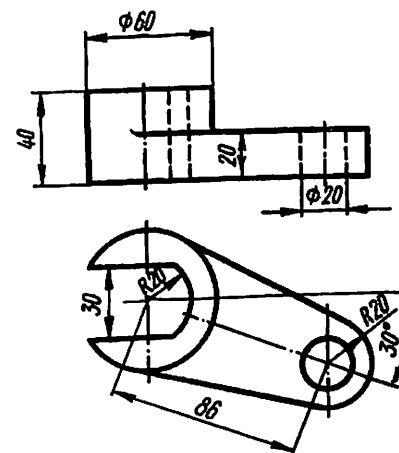
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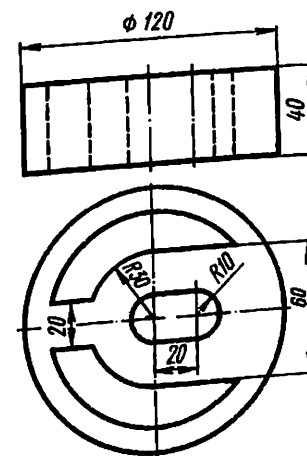
8



9



10



## **19–23-topshiriqlarning qisqacha bayoni**

### **19-topshiriq. Rezbalarni chizmada tasvirlash**

Topshiriq A4 formatli qog'oz varag'ida bajarilib, o'quvchilarda rezbali chizmalarni bajarish ko'nikmalarini shakllantirishga mo'ljallangan. Ushbu topshiriqda rezbalarning chizmada tasvirlanishi bilan birgalikda ularning o'lchamlari chizmada to'g'ri tasvirlanishiga ham e'tibor qaratiladi. Topshiriqni bajarishga kirishishdan oldin o'quvchilarning nazariy bilimlarini quyidagi savollar orqali tekshirib ko'rish tavsiya qilinadi:

1. Metrik rezbalar chizmada qanday tasvirlanadi?
  2. Sterjenga o'yilgan rezbaning katta (tashqi) diametri qanday chiziqda tasvirlanadi? Kichik (ichki) diametri-chi?
- Yaqqol tasvirdan foydalanib detal chizmasini bajaring, o'lchamlarini qo'ying.

### **20-topshiriq. Rezbalarni chizmada tasvirlash**

Ushbu topshiriq mazmunan oldingi topshiriqning mantiqiy davomi bo'lib, unda o'quvchilarda teshikka o'yilgan rezbalar chizmalarini bajarish ko'nikmalarini shakllantirish ko'zda tutilgan. Topshiriq varianti A4 formatli chizma qog'oziga ko'chirib olinganidan keyin chizmadagi belgilangan joyda ko'rsatilgan diametrdagi rezbali teshik chizmada tasvirlanib, o'lchamlari qo'yiladi.

### **21-topshiriq. Rezba va rezbali birikmalar chizmalari**

Topshiriq variantidagi yaqqol tasvirda rezbali birikma va teshikka o'yilgan rezba tasviri keltirilgan. O'quvchilardan ushbu topshiriqda zarur qirqimlardan foydalangan holda rezbali birikma chizmasini bajarish va o'lchamlarini qo'yish talab qilinadi.

- O'quvchilar bilimini tekshirish uchun savollar:
1. Qanday birikmalarga ajraladigan birikmalar deyiladi? Misollar keltiring.
  2. Mahsulotlarni standartlashtirish qanday afzalliklarga ega?

3. Ajralmaydigan birikmalarga misollar keltiring. Qanday holda ajralmaydigan birikmalardan foydalaniladi?

### **22-topshiriq. Boltli va shpilkali birikmalar chizmalari**

Rezbali birikmalar ajraladigan birikmalar ichida eng ko'p tarqalgani hisoblanadi. Ularga boltli, shpilkali va vintli birikmalar kiradi.

O'qituvchi ko'rsatmasi bo'yicha boltli yoki shpilkali birikmalardan birining shartli soddalashtirilgan chizmasini bajaring.

### **23-topshiriq. Yig'ish chizmalarini detallarga ajratish**

Har bir topshiriq variantida keltirilgan yig'ish chizmasini o'qish va ishlash prinsipini tushunishni osonlashtirish maqsadida tushuntirish matni, aksonometriya hamda tafsilotli ro'yxat keltirilgan. Yig'ish chizmalari variantlari sifatida o'quvchilarga fizika, kimyo, mehnat va texnika to'garaklari mashg'ulotlarida ko'p uchraydigan detallar va yig'ish birliklari tanlab olingan.

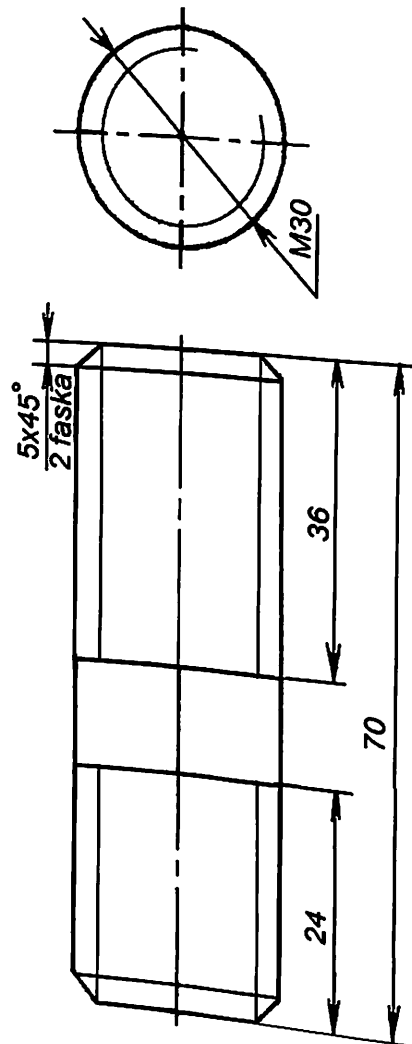
Ushbu topshiriqni quyidagi tartibda bajarish tavsiya qilinadi:

1. Berilgan yig'ish birligi va uning alohida qismlarining vazifalari va ishlash prinsipini ta'riflab bering. Yig'ish birligi qanday ketma-ketlikda qismlarga ajratiladi va yig'iladi?

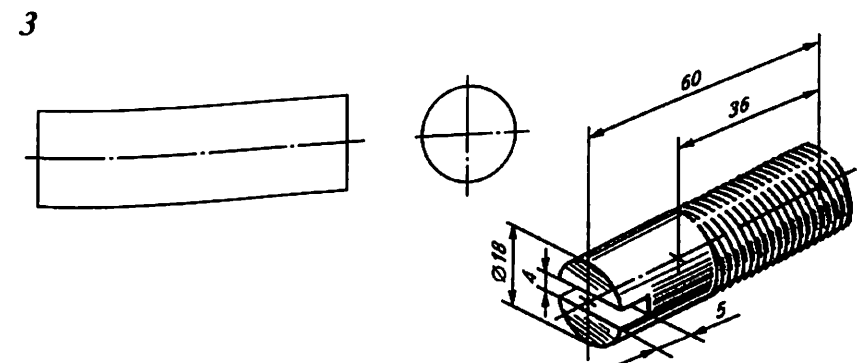
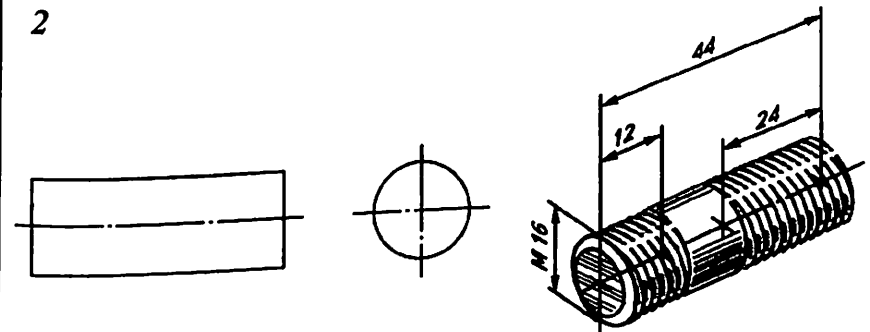
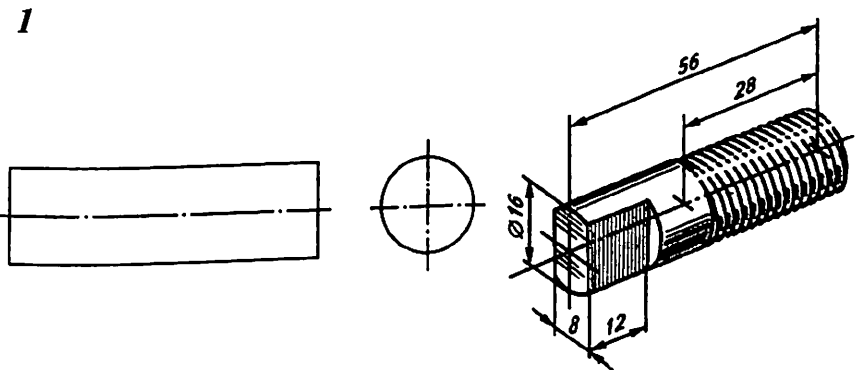
2. Ikki-uchta detal chizmasini va ulardan birining aksonometrik proyeksiyasini bajaring.

Standartlarga asosan yig'ish chizmalariga minimal o'lchamlar qo'yilishi sababli yetishmaydigan o'lchamlar grafik usul bilan (masalan, chiziqli masshtab yordamida) aniqlanadi.

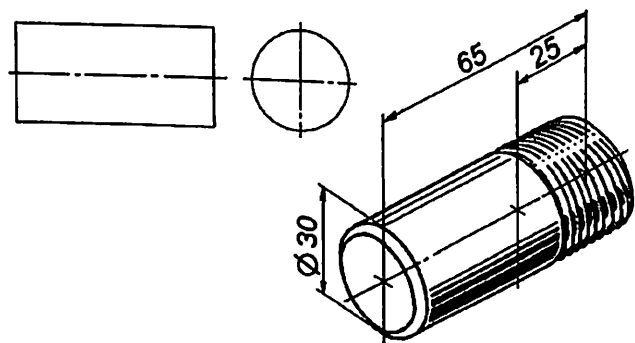
19-topshiriq – «Rezbalarni chizmada tasvirlash»  
namunasi



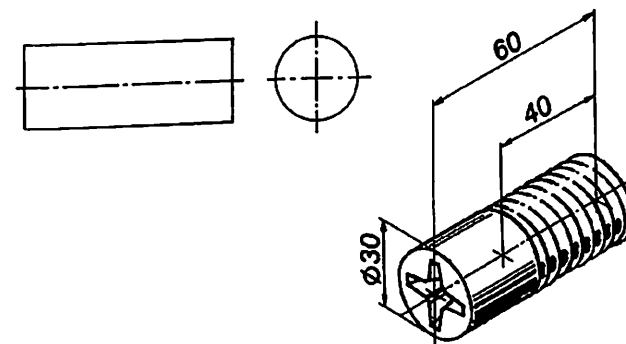
19-topshiriq variantlari



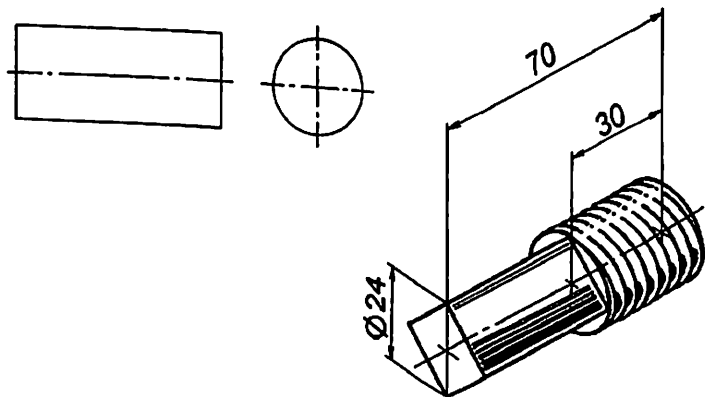
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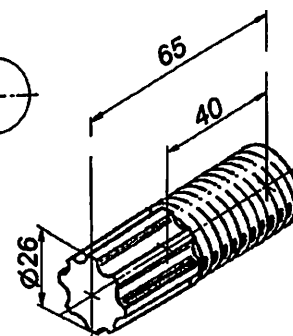
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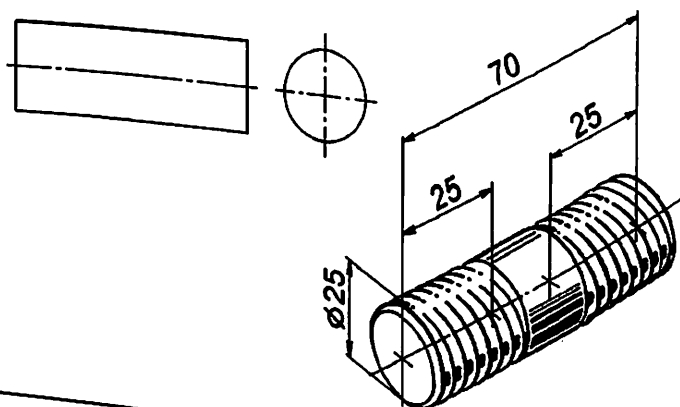
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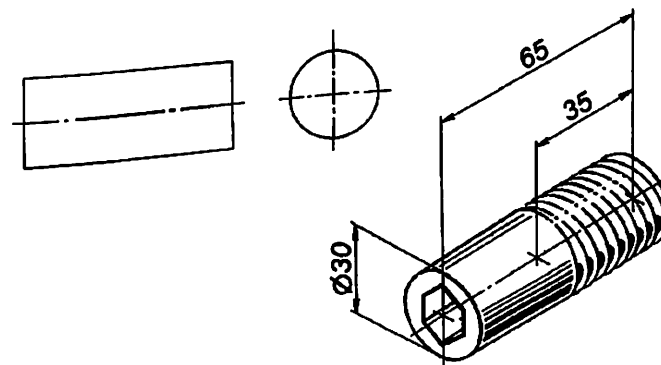
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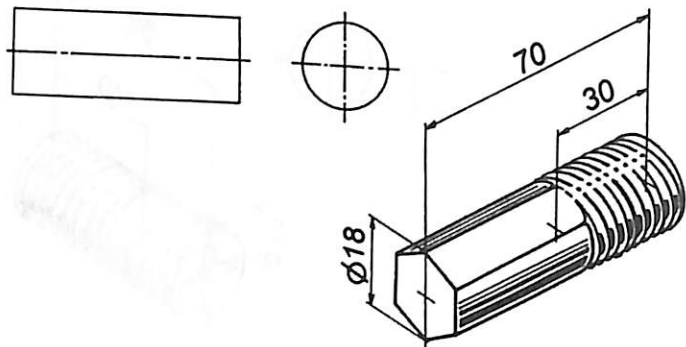
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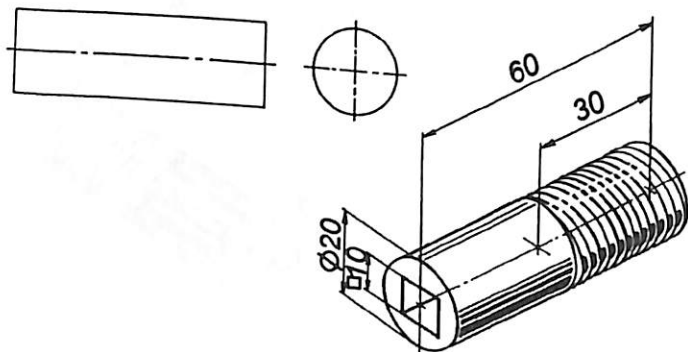
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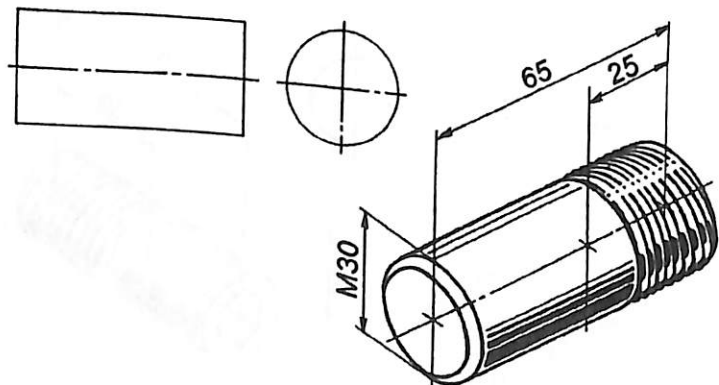
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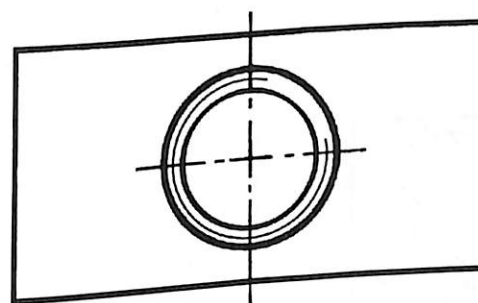
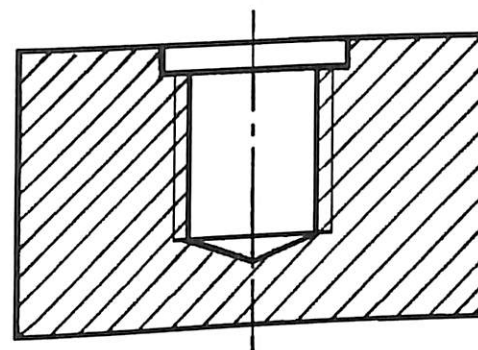


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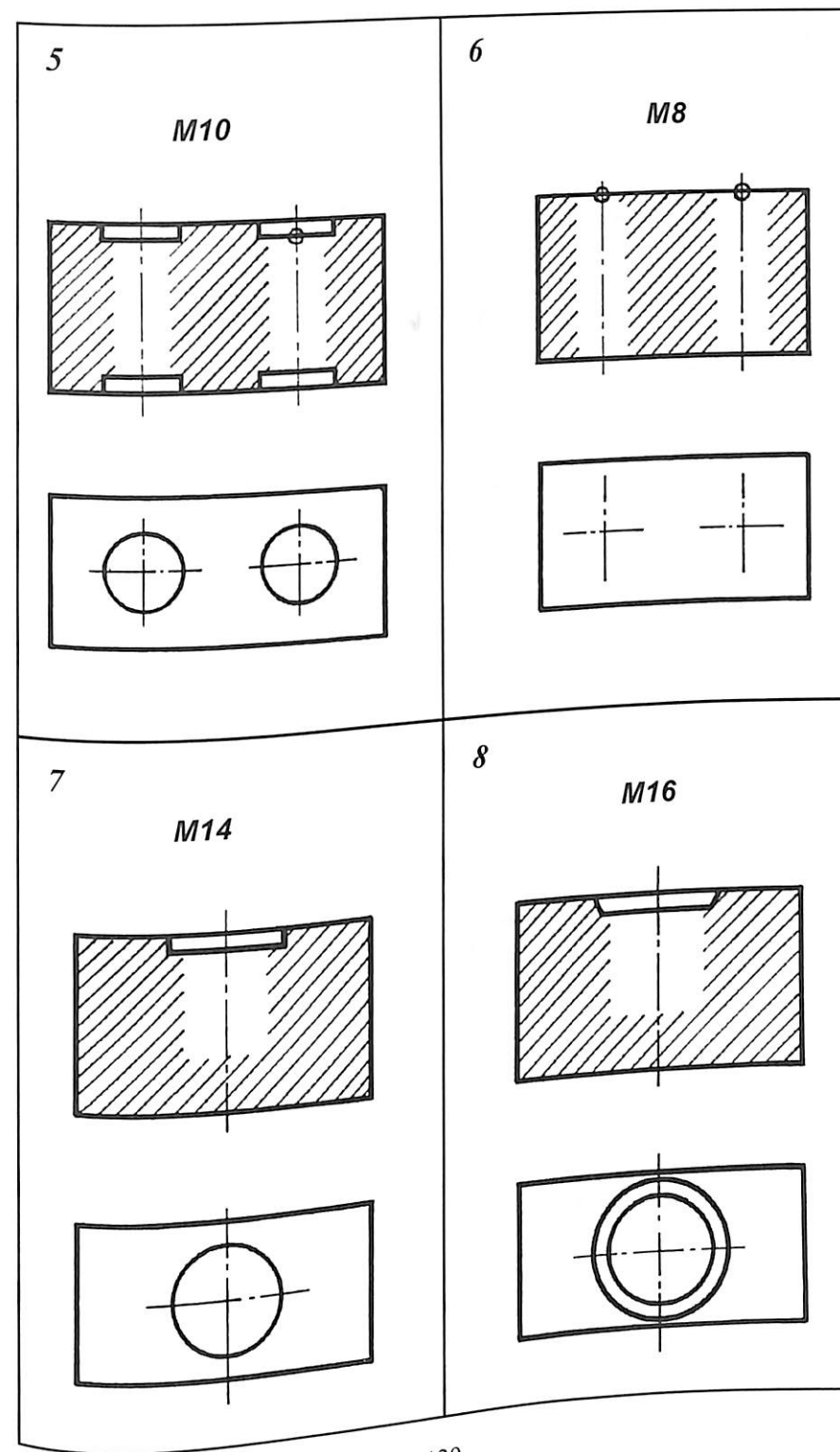
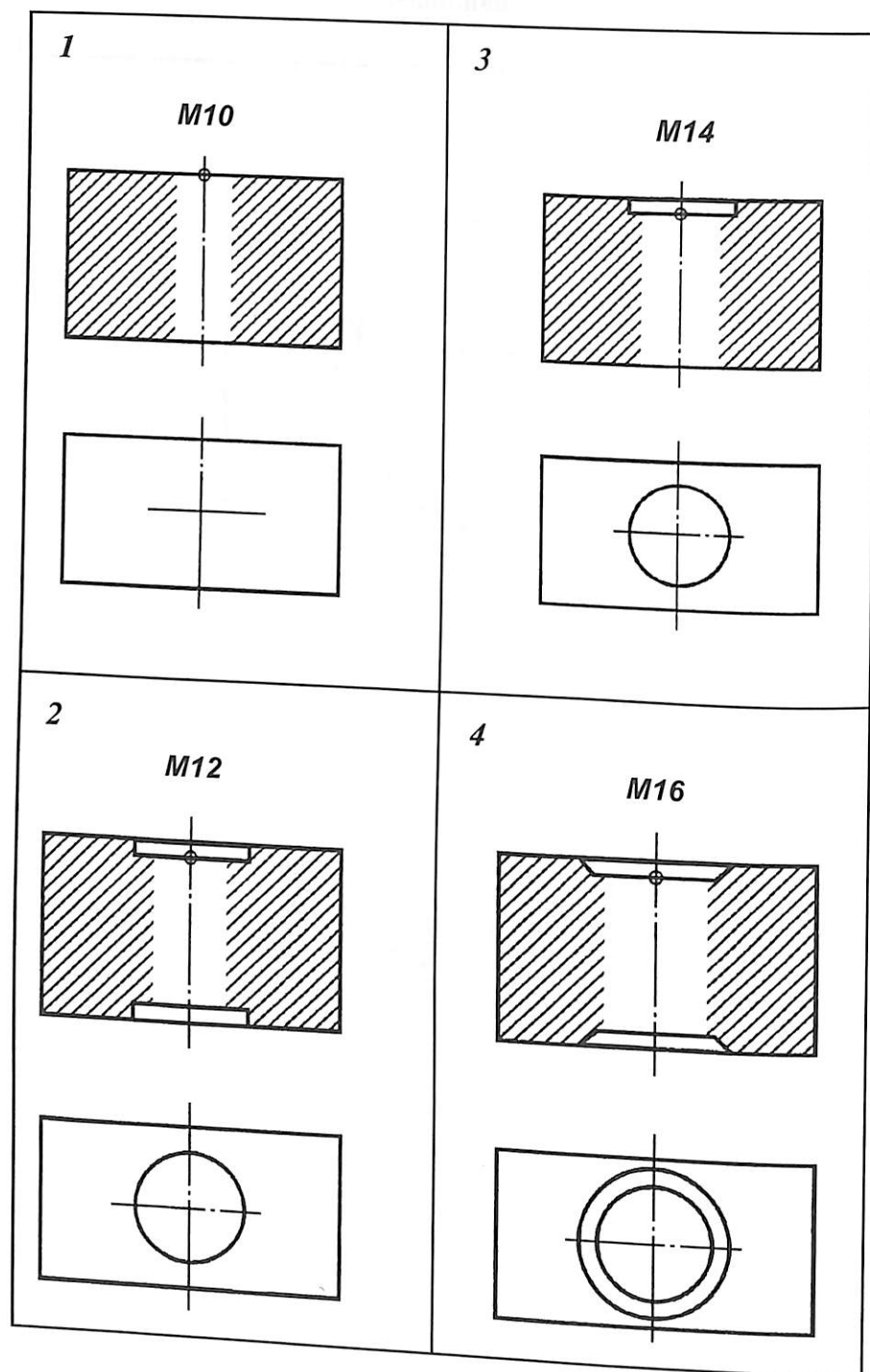


20-topshiriq – «Rezbalarni chizmada tasvirlash»  
namunasi

M12



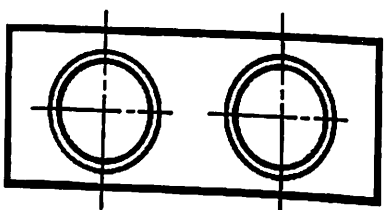
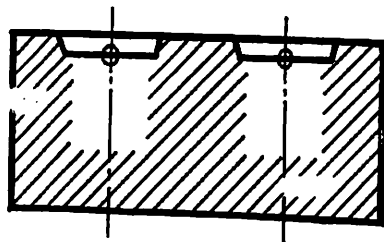
# 20-topshiriq variantlari





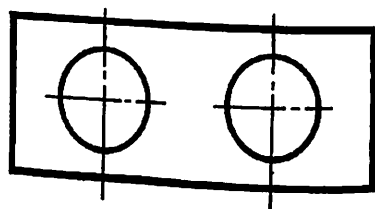
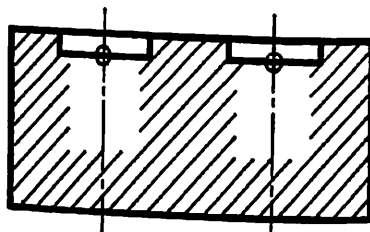
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M12



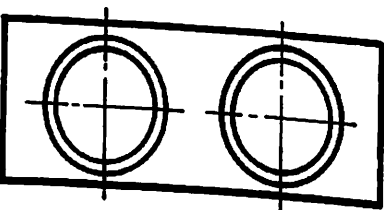
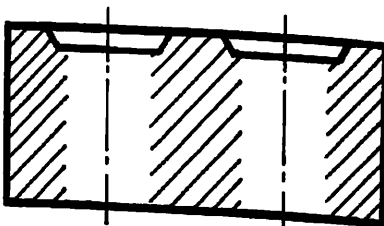
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M10



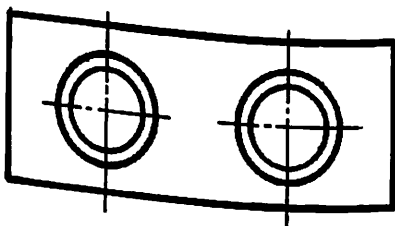
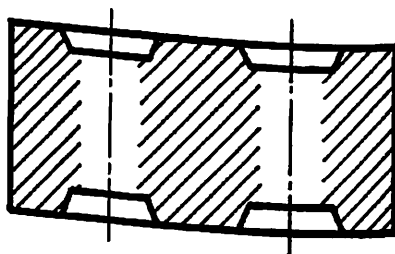
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M14

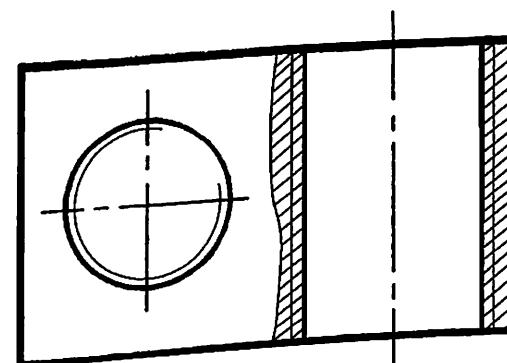
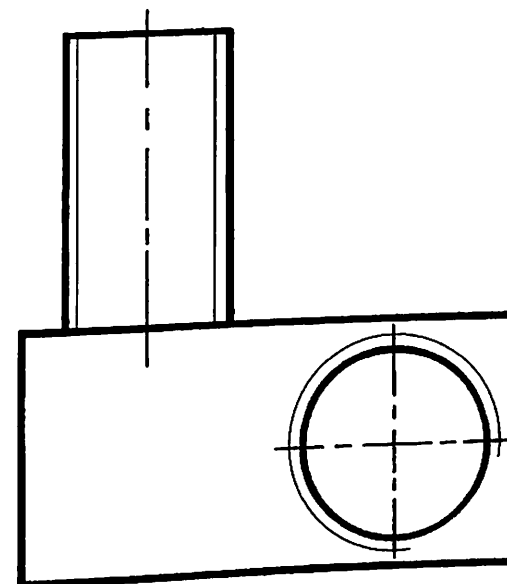


12

M10



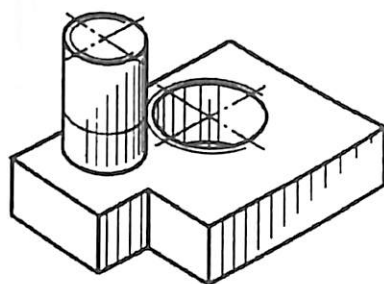
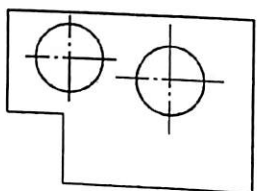
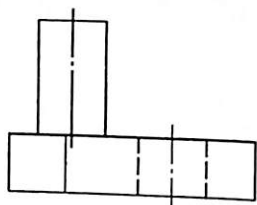
21-topshiriq – «Rezba va rezbali birikmalar chizmalari»  
namunasi



## 21-topshiriq variantlari

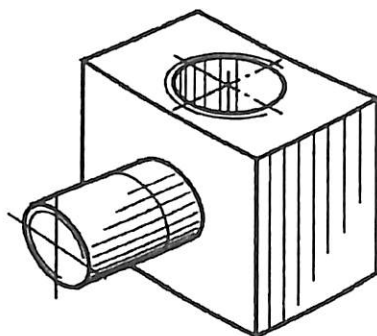
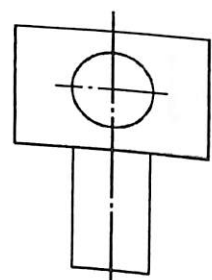
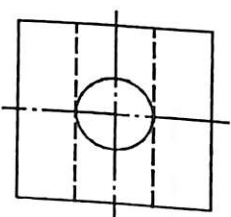
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Sterjendagi rezba – M12  
Teshikdagi rezba – M16



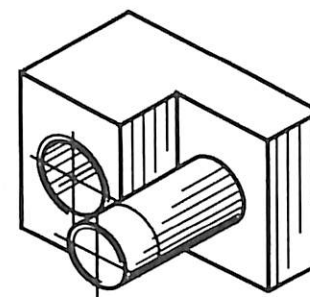
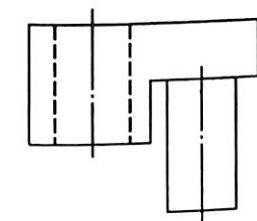
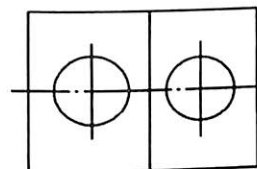
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Sterjendagi rezba – M12  
Teshikdagi rezba – M14



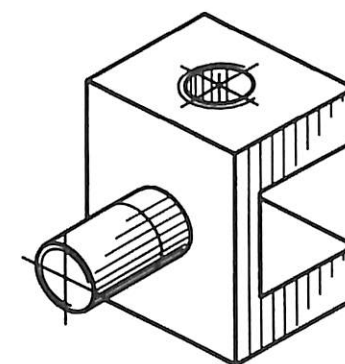
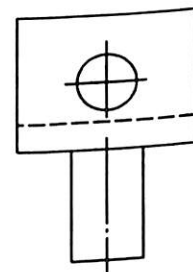
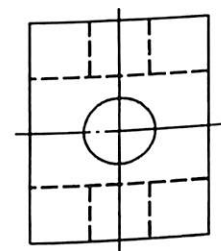
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Sterjendagi rezba – M12  
Teshikdagi rezba – M16



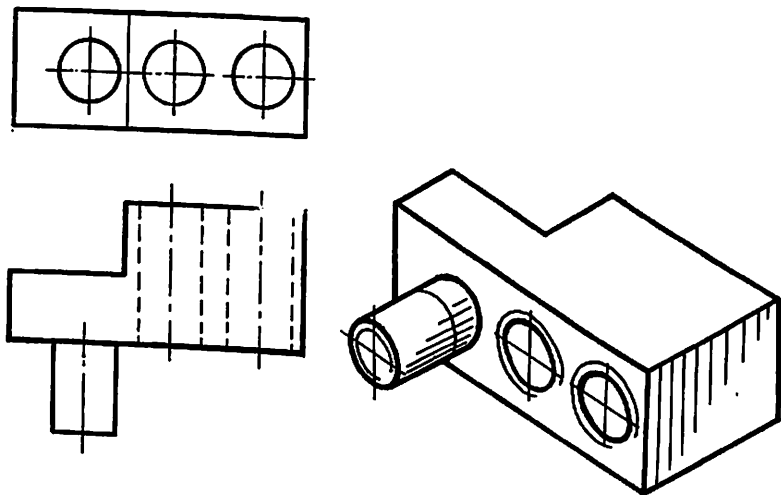
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Sterjendagi rezba – M12  
Teshikdagi rezba – M12



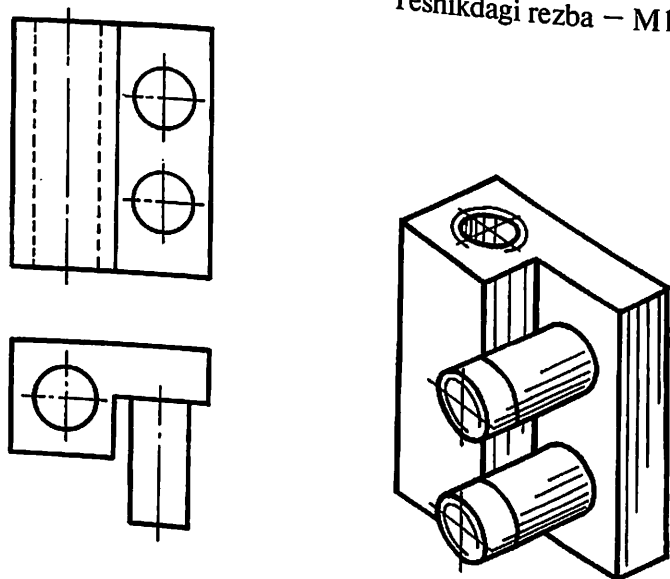
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Sterjendagi rezba – M14  
Teshikdagi rezba – M14



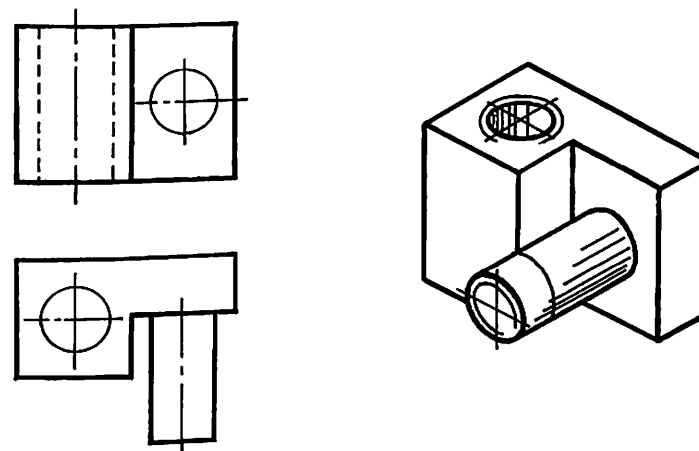
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Sterjendagi rezba – M16  
Teshikdagi rezba – M14



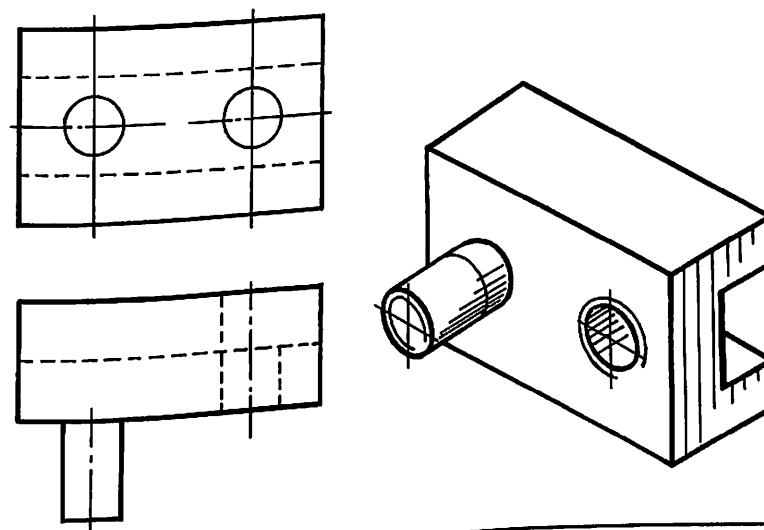
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Sterjendagi rezba – M16  
Teshikdagi rezba – M14



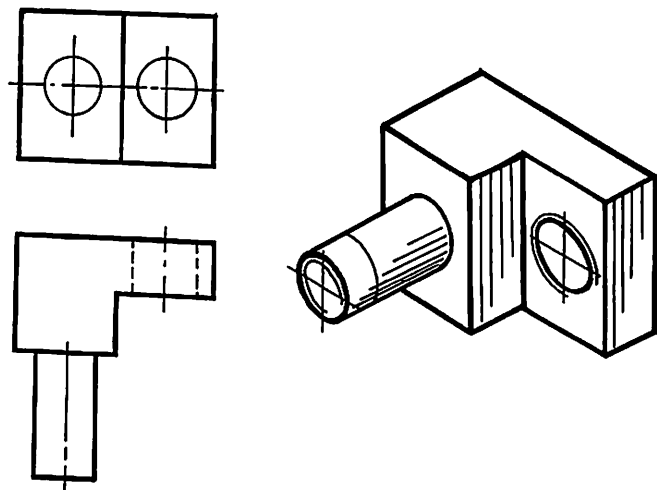
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Sterjendagi rezba – M12  
Teshikdagi rezba – M12



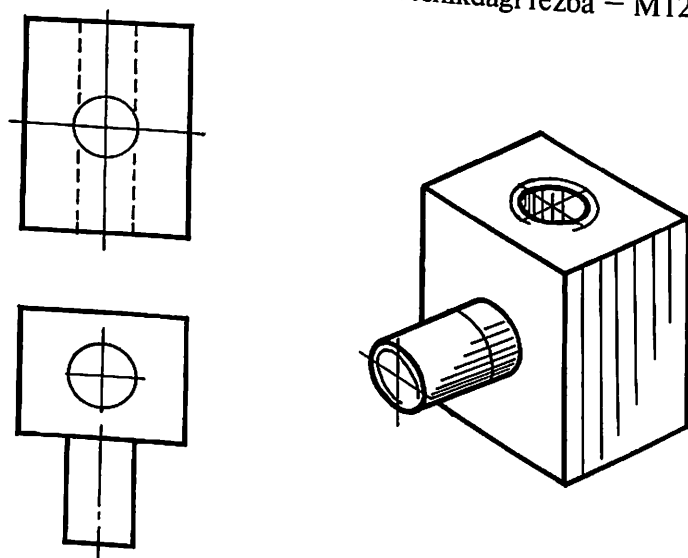
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Sterjendagi rezba – M14  
Teshikdagi rezba – M16



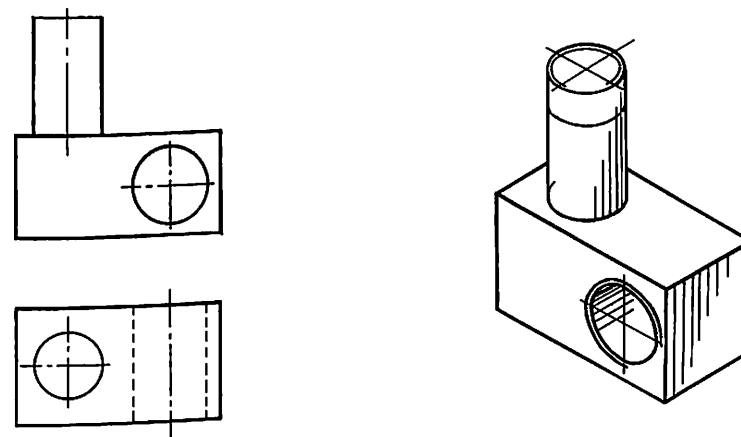
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Sterjendagi rezba – M12  
Teshikdagi rezba – M12



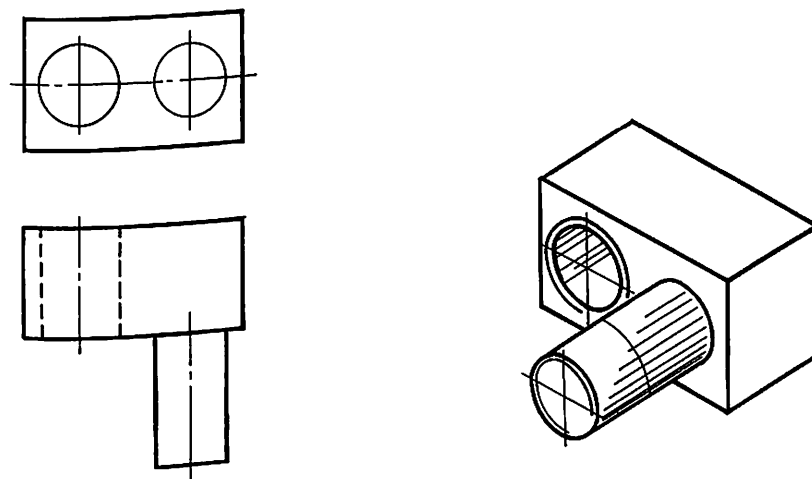
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Sterjendagi rezba – M12  
Teshikdagi rezba – M16

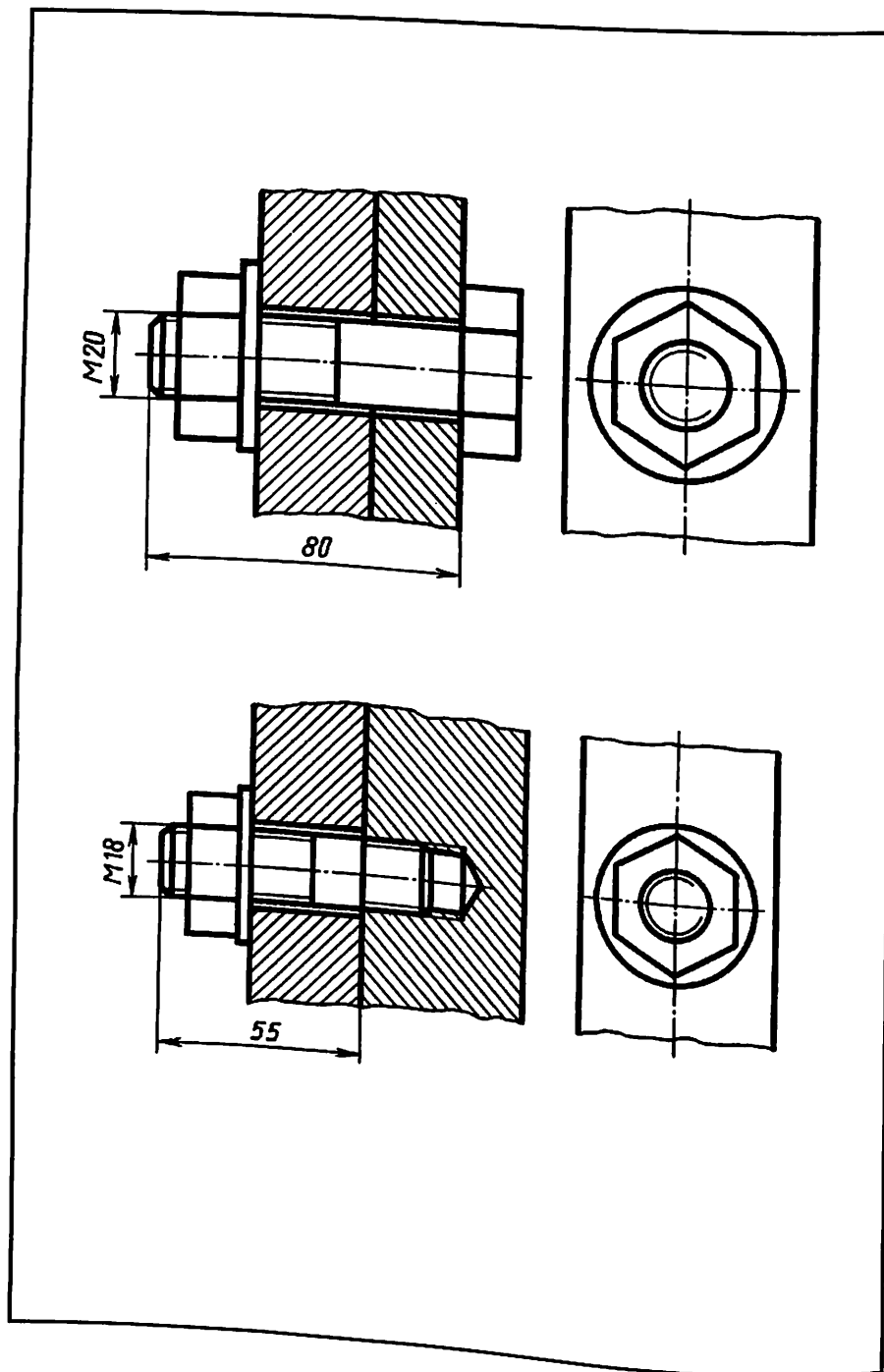


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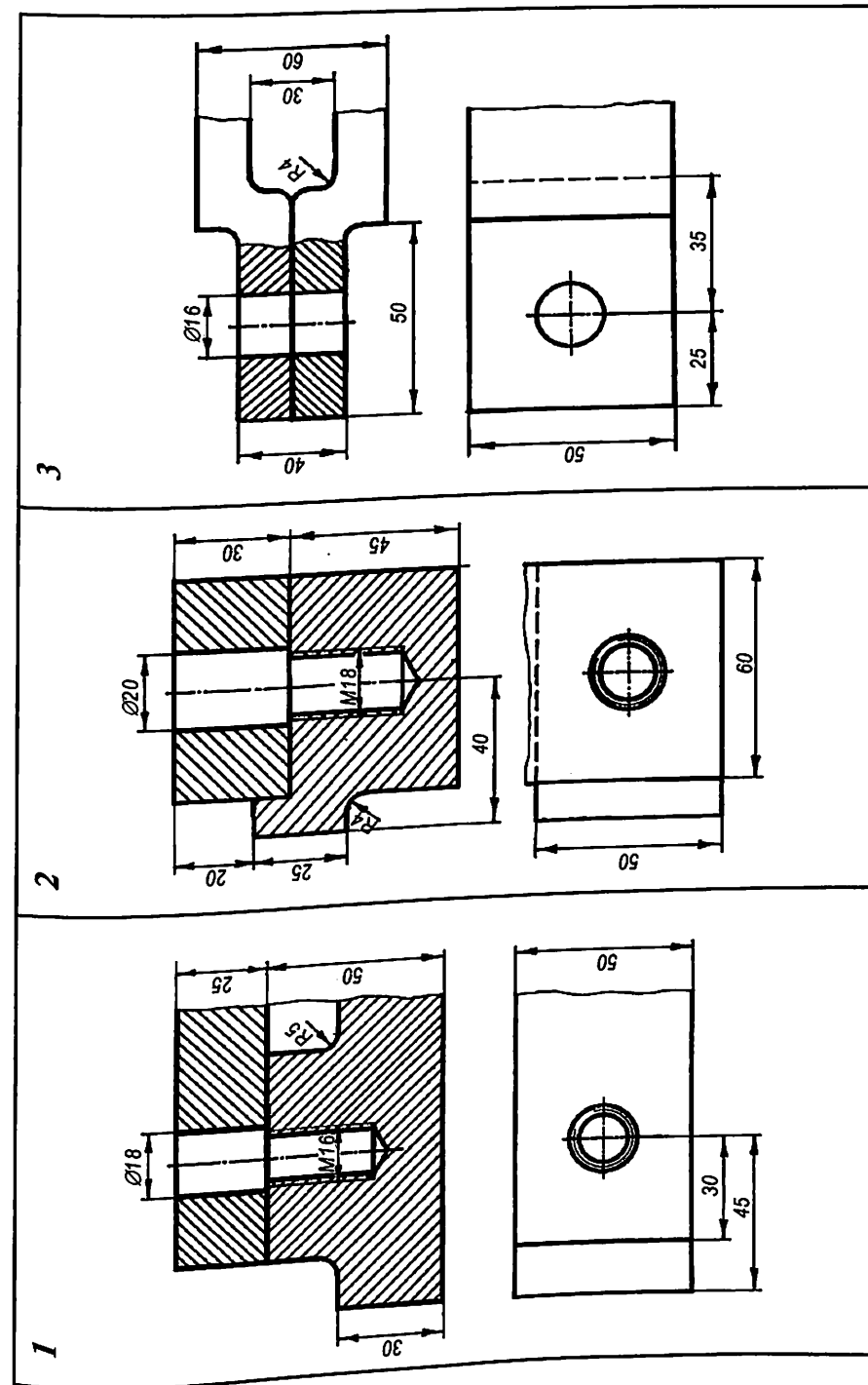
Sterjendagi rezba – M16  
Teshikdagi rezba – M16



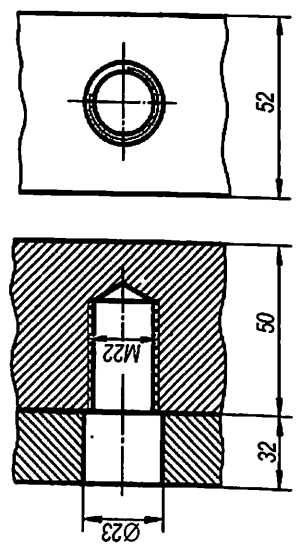
22-topshiriq – «Boltli va shpilkali birikmalar chizmalari»  
namunasi



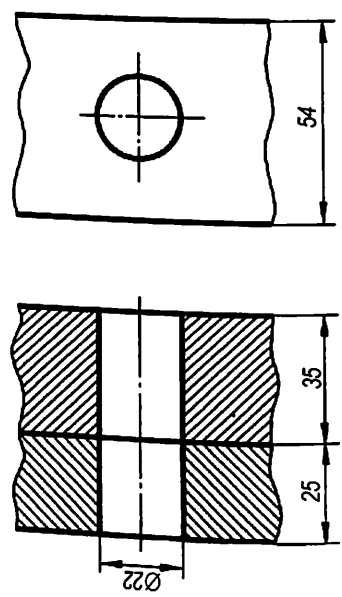
22-topshiriq variantlari



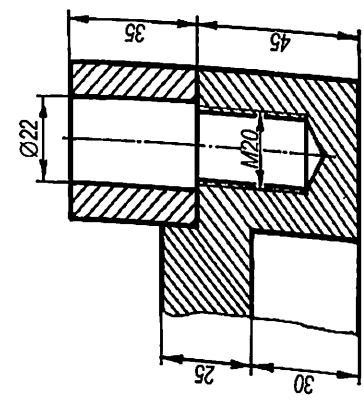
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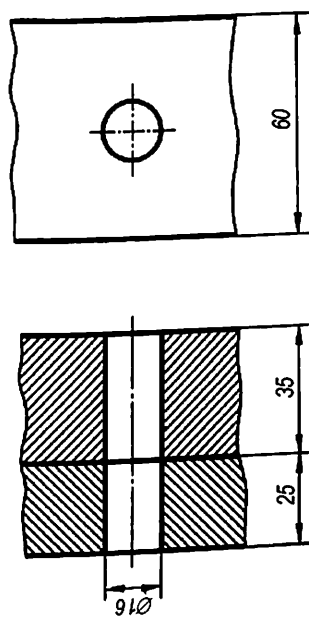
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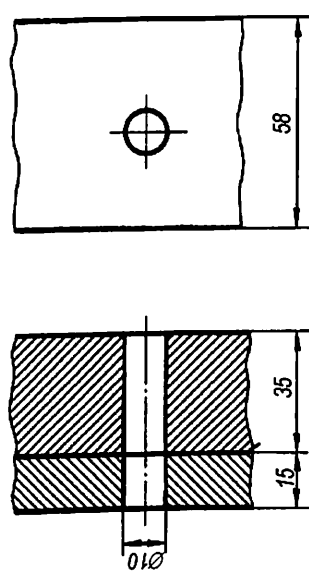
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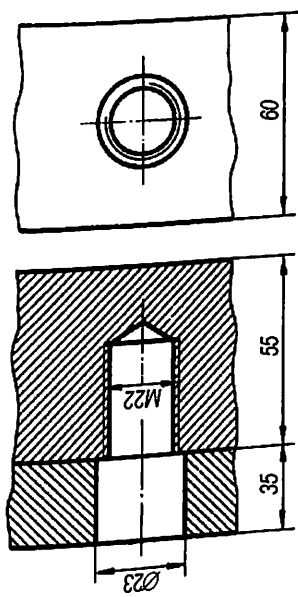
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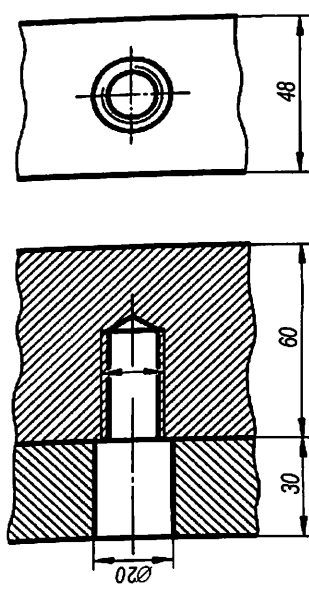
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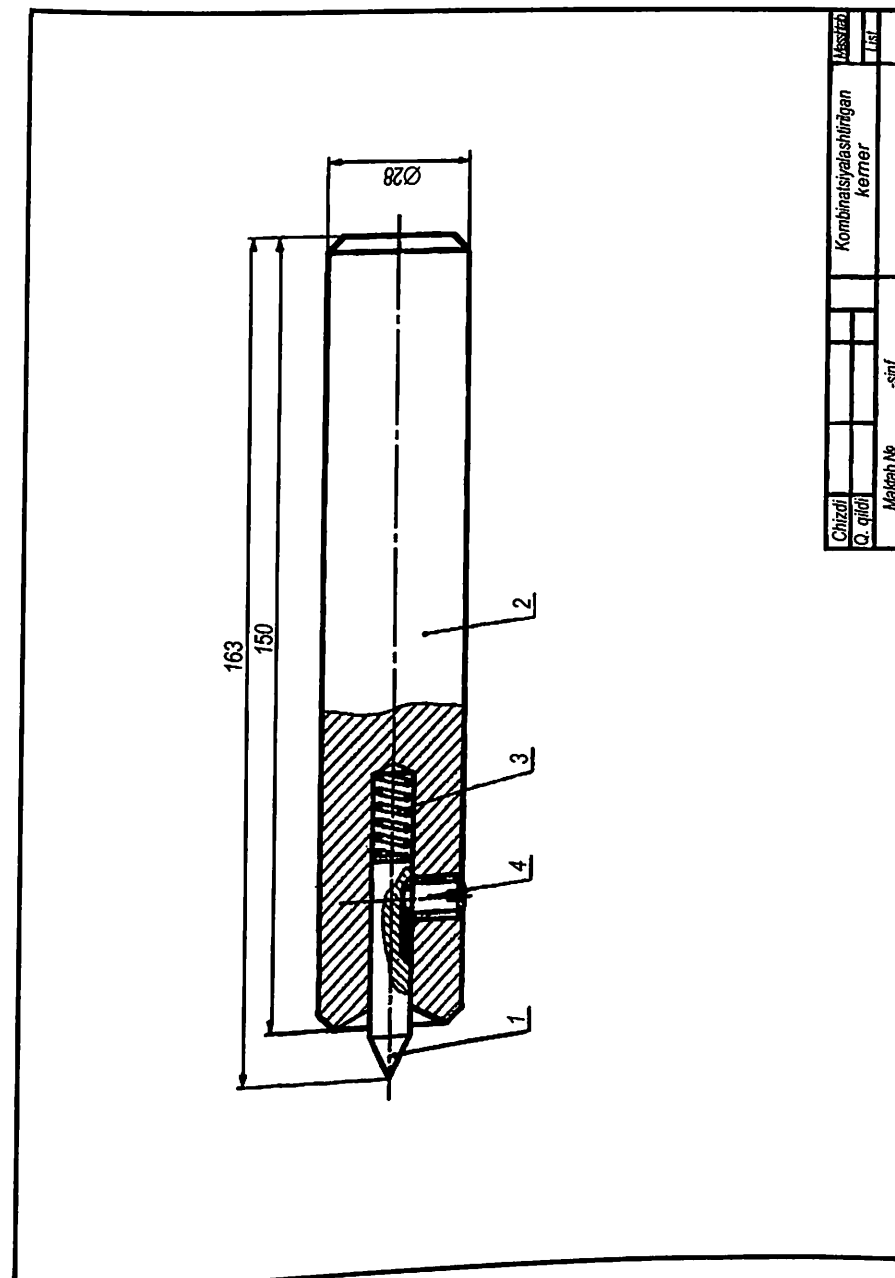
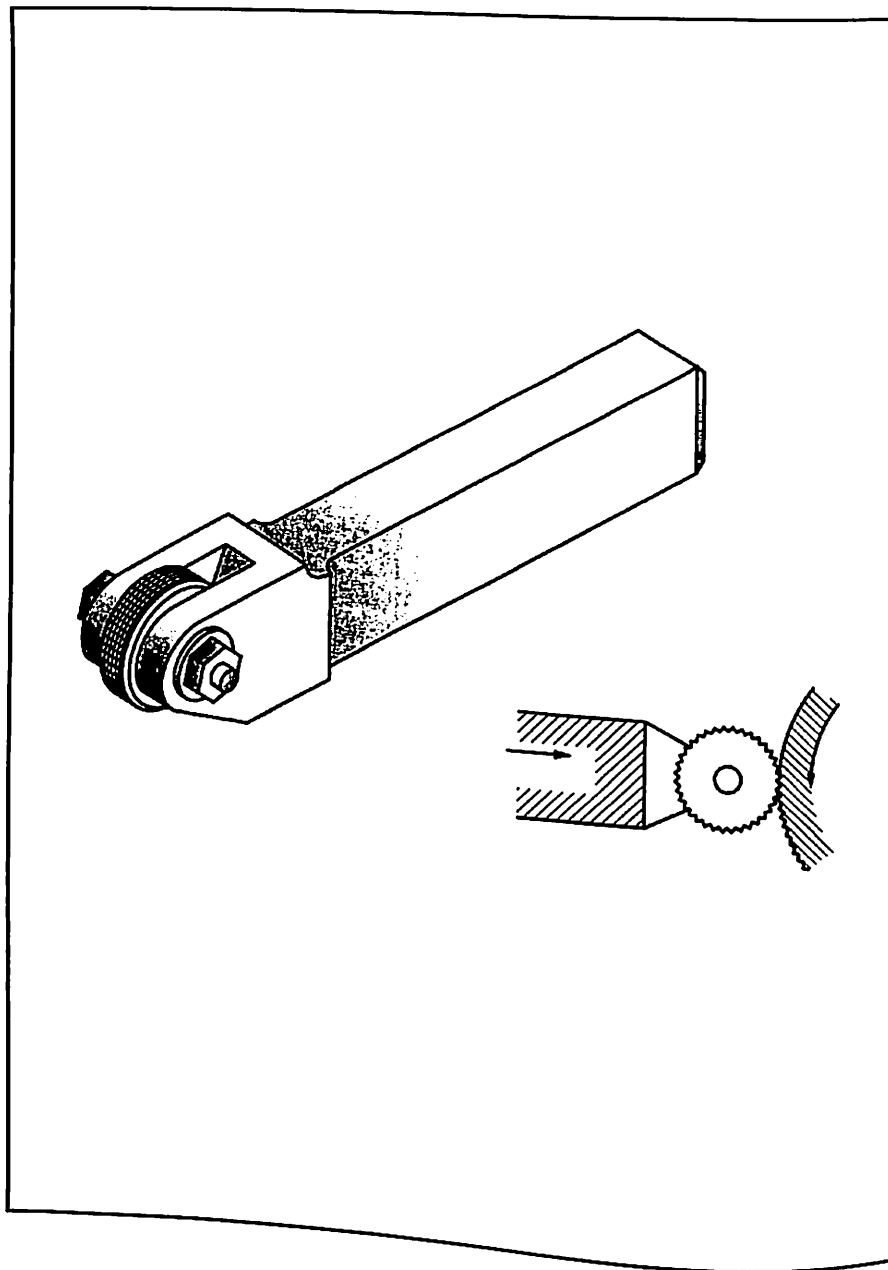
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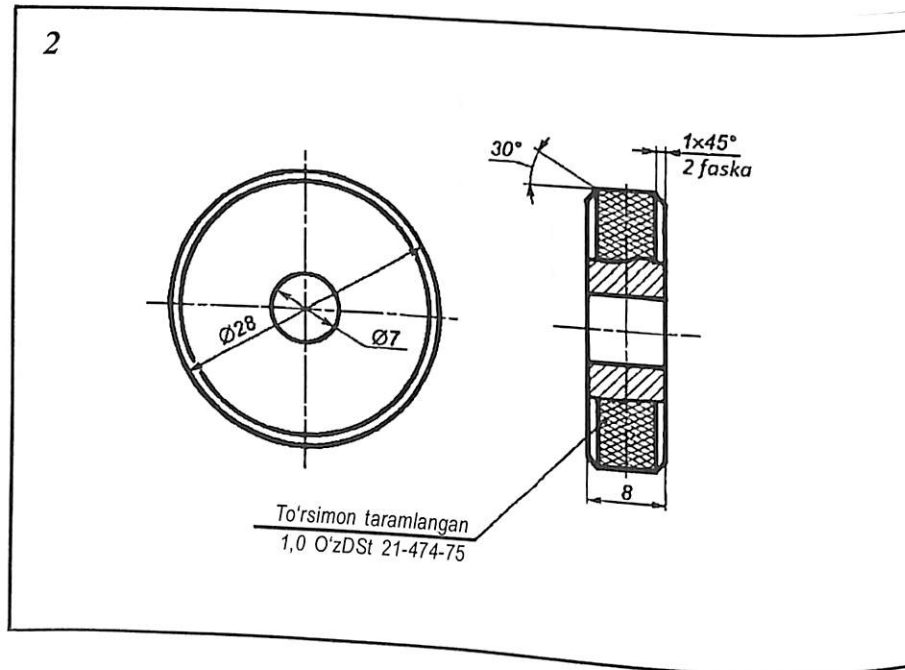
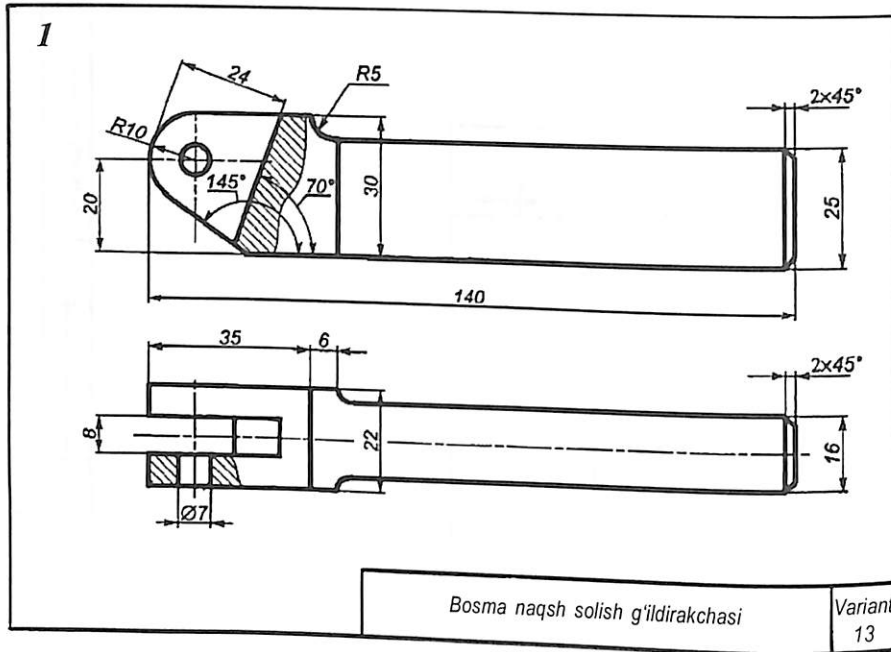
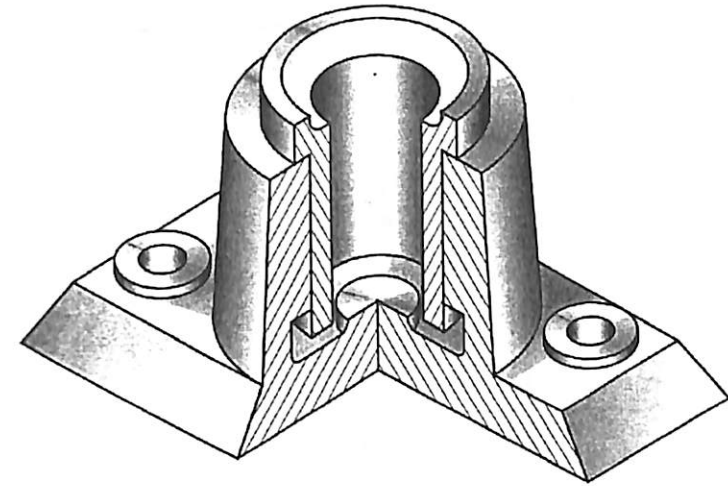
9



23-topshiriq varianti — «Yig'ish chizmalarini detallarga ajratish» va shu topshiriq chizmasini bajarish namunasi



## 23-topshiriq variantlari



| O'ri            | Nomi             | Material        | Eslatma |
|-----------------|------------------|-----------------|---------|
|                 | Hujjatlar        |                 |         |
|                 | Yig'ish chizmasi |                 |         |
|                 | Detallar         |                 |         |
| 1               | Korpus           | 1 Cho'yan SCh15 |         |
| 2               | Vkladish         | 1 Cho'yan SCh15 |         |
|                 |                  |                 |         |
| Tirgak          |                  |                 | Mash    |
| Chizdi          |                  |                 | List    |
| Qiladi          |                  |                 |         |
| Maktab № - sinf |                  |                 |         |

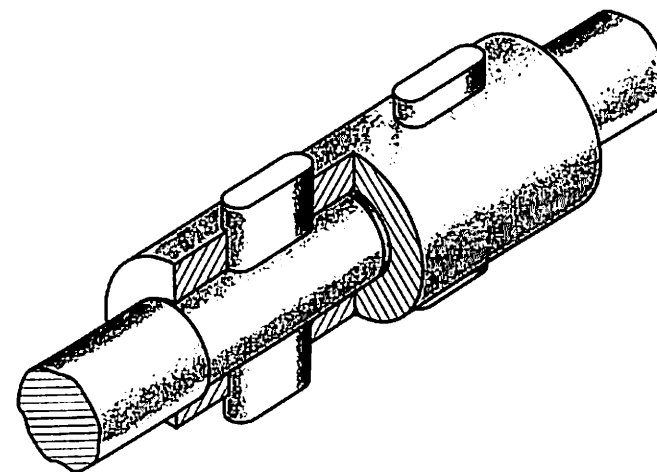
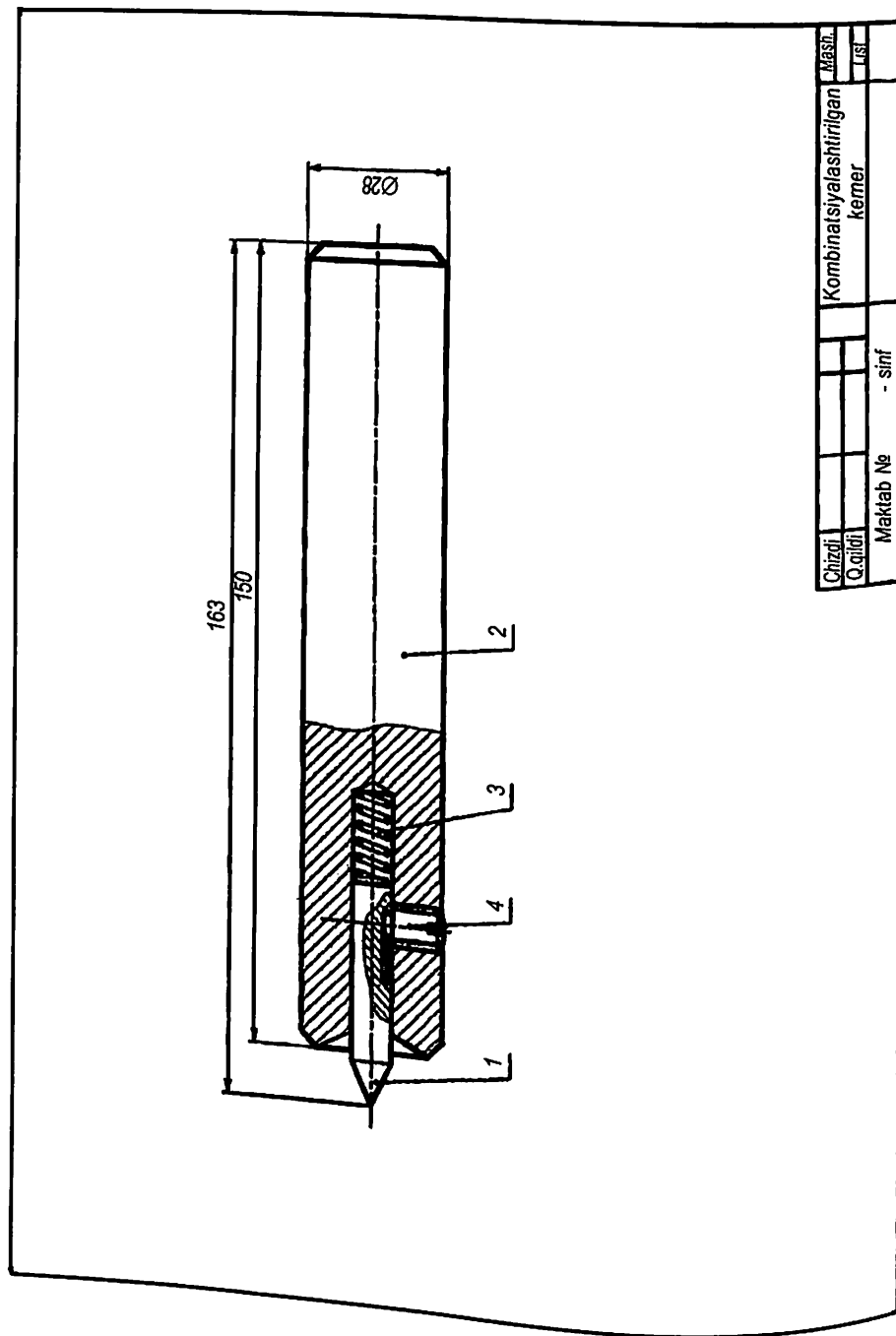
### 1. Tirgak

*Tirgak* – val o'qi bo'ylab yuzaga keladigan kuchlanishni qabul qiladigan tirgovuch podshipnik. Podshipnik – val va aylanuvchi o'qlarning tayanchi hisoblanadi. Ishqalanish turlariga ko'ra podshipniklar sirpanuvchi va tebranuvchi bo'ladi.

Chizmada sirpanuvchi tirgovuch podshipnik (подпятник) tasvirlangan. Uning korpusi 1 ga oldin vkladish 2 va undan keyin korpus pastki qismining chiqig'iga tiraladigan val uchi o'rnatiladi.







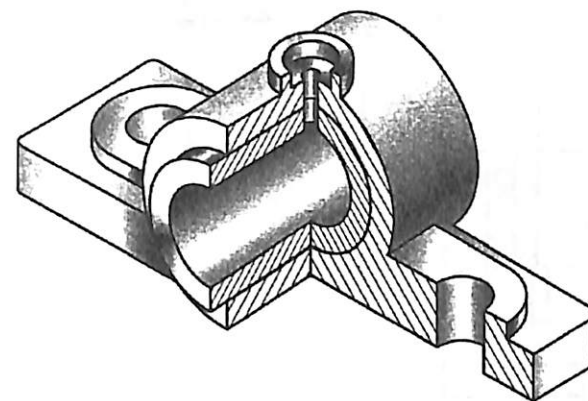
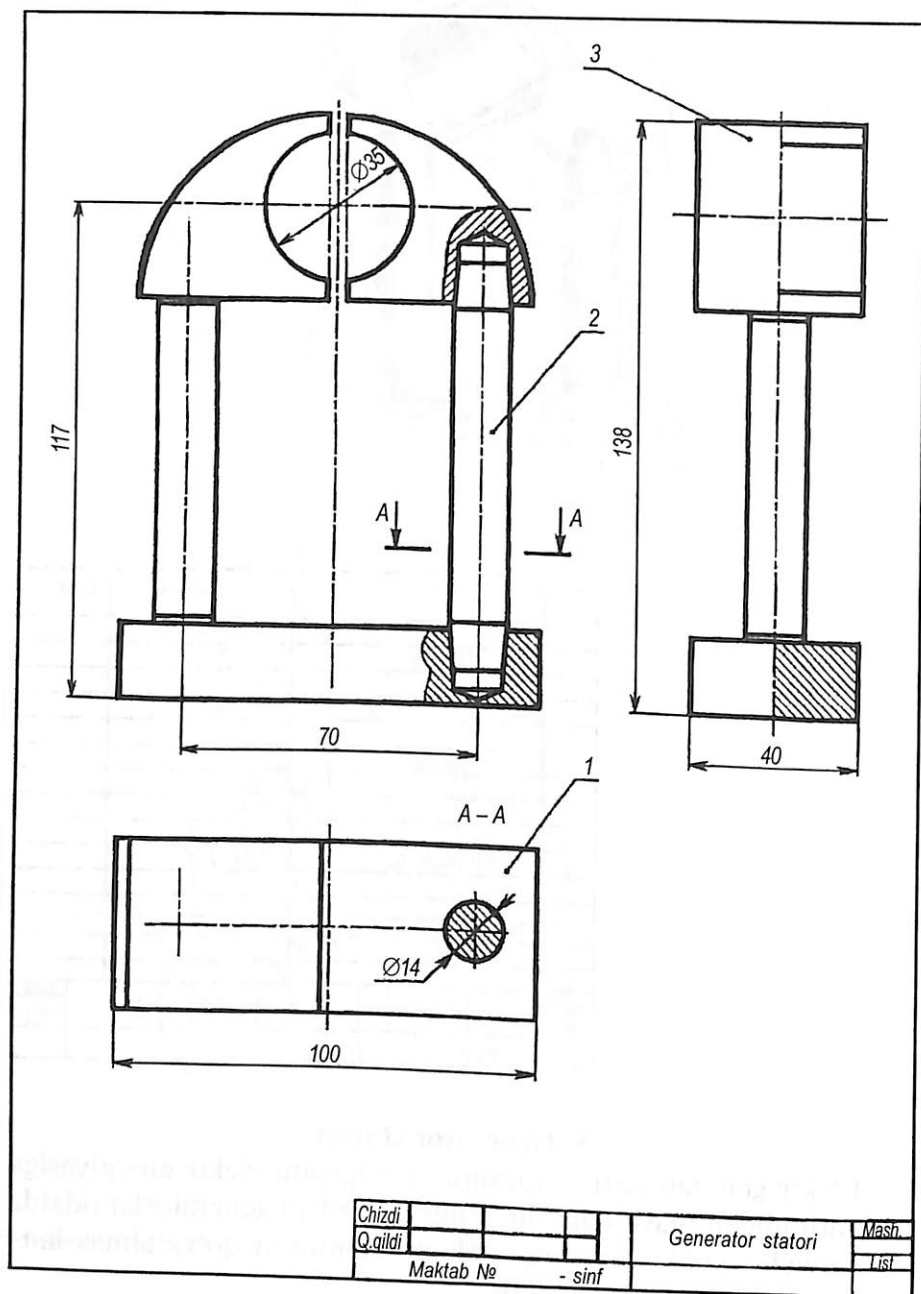
| O'ri     | Nomi             | Soni   | Material        | Eslatma |
|----------|------------------|--------|-----------------|---------|
|          | Hujjatlar        |        |                 |         |
|          | Yig'ish chizmasi |        |                 |         |
|          | Detallar         |        |                 |         |
| 1        | Mufta            | 1      | Po'lat 40       |         |
| 2        | Pona             | 2      | Po'lat 40       |         |
| 3        | Val              | 2      | Po'lat 2        |         |
|          |                  |        |                 |         |
| Chizdi   |                  |        | Ponasimon mufta | Mash.   |
| Q.ildi   |                  |        |                 | List    |
| Maktab № |                  | - sinf |                 |         |

### 3. Ponasimon mufta

*Ponasimon mufta* – vallarni qismlarga ajraladigan holda biriktiruvchi moslama. Biriktirishda val uchlarini muftaga shunday joylashtirish kerakki, bunda vallar 3 dagi teshiklar mufta 1 tuy-nugiga to'g'ri kelishi kerak. Shundan keyin ponalar 2 o'rnatilib, vallar birlashtiriladi.



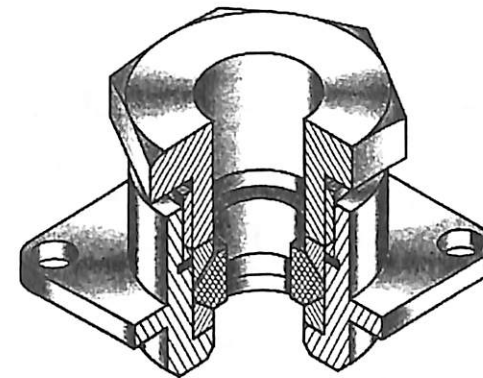
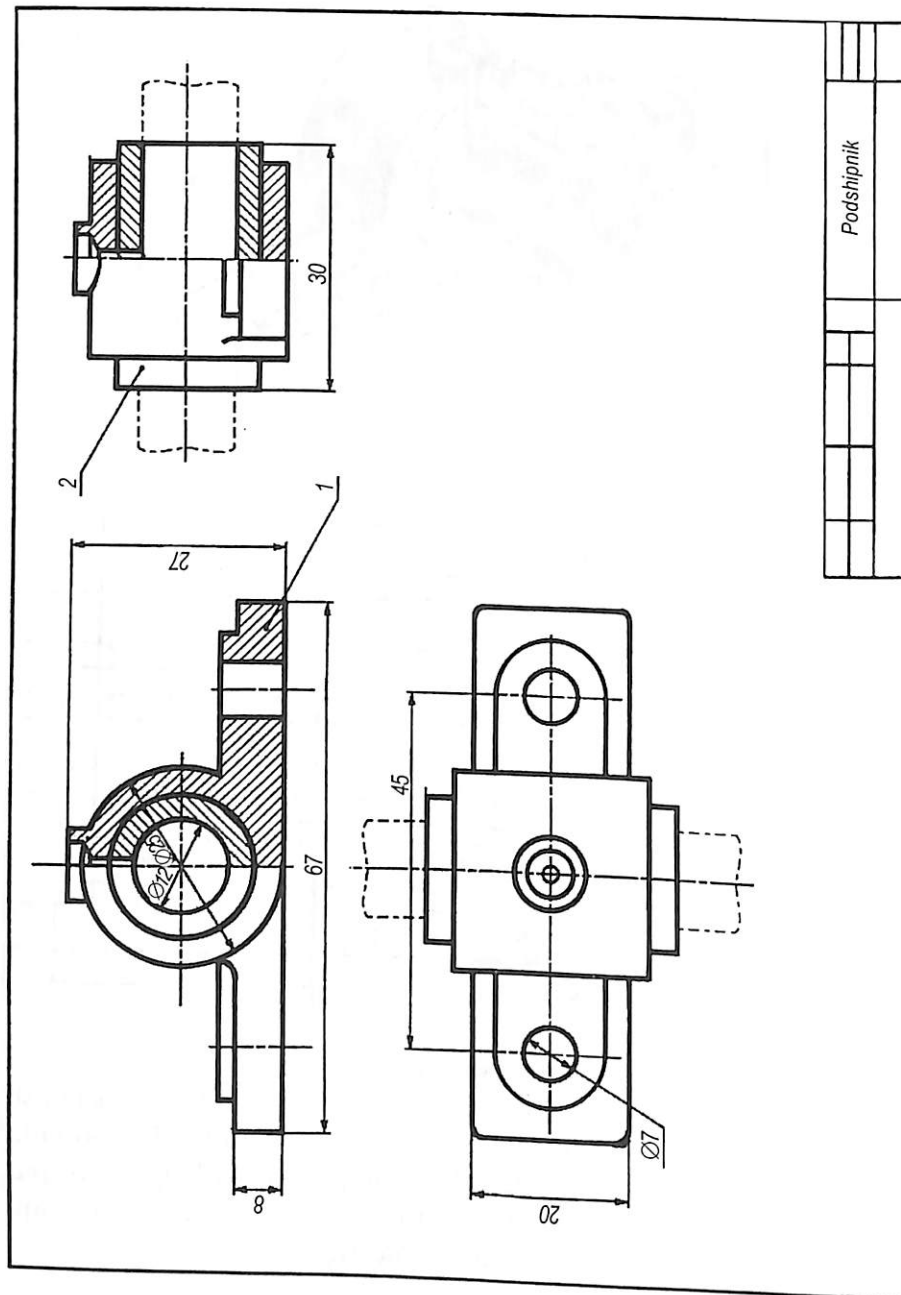




| O'ri     | Nomi             | Soni   | Material   | Eslatma |
|----------|------------------|--------|------------|---------|
|          | Hujjatlar        |        |            |         |
|          | Yig'ish chizmasi |        |            |         |
|          | Detallar         |        |            |         |
| 1        | Korpus           | 1      | Jez LMsS58 |         |
| 2        | Vkladish         | 1      | Jez LMsS58 |         |
|          |                  |        |            |         |
| Chizdi   |                  |        | Podshipnik | Mash    |
| Q.ildi   |                  |        |            | List    |
| Maktab № |                  | - sinf |            |         |

## 6. Podshipnik

*Podshipnik* — val va aylanadigan o'qlarning tayanchi. Ishqalanish turiga ko'ra tebranuvchi va sirpanuvchi podshipniklar bo'ladi. Chizmada ajralmaydigan sirpanish podshipnigi tasvirlangan. Korpus 1 ning ustki qismi va unga mahkamlangan vkladishda vaqt-vaqti bilan moylab turish uchun teshik qoldirilgan.



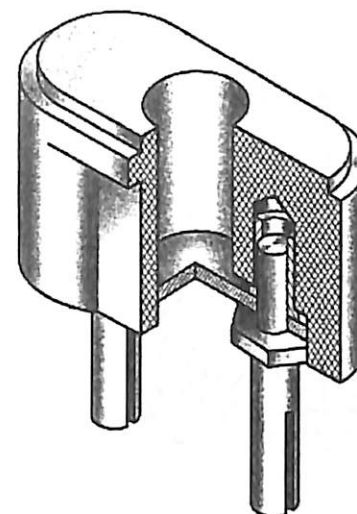
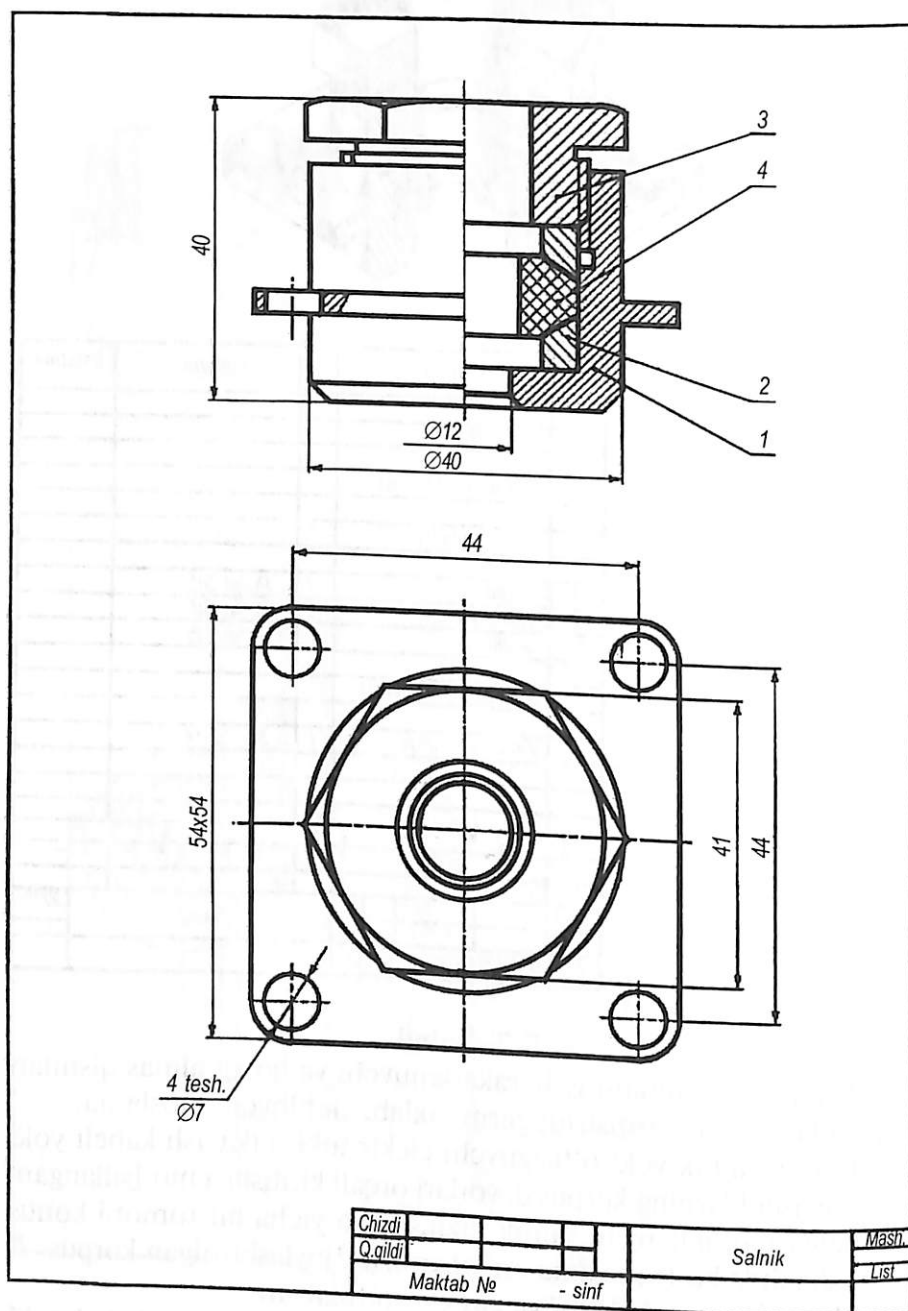
| O'ri                                                                                                                                                                           | Nomi                 | Soni | Material   | Eslatma |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------|------------|---------|
|                                                                                                                                                                                | Hujjatlar            |      |            |         |
|                                                                                                                                                                                | Yig'ish chizmasi     |      |            |         |
|                                                                                                                                                                                | Detallar             |      |            |         |
| 1                                                                                                                                                                              | Korpus               | 1    | Po'lat St5 |         |
| 2                                                                                                                                                                              | Vtulka (tiqin)       | 2    | Po'lat St5 |         |
| 3                                                                                                                                                                              | Gayka                | 1    | Po'lat St5 |         |
|                                                                                                                                                                                | Standart mahsulotlar |      |            |         |
| 4                                                                                                                                                                              | Zichlovchi halqa     | 1    | St 32-14   |         |
| <div style="display: flex; justify-content: space-between;"> <div> Chizdi<br/>Qildi </div> <div> Maktab № - sinf </div> <div> Salnik </div> <div> Mash.<br/>List </div> </div> |                      |      |            |         |

## 7. Salnik

*Salnik* – qurilmaning harakatlanuvchi va qo'zg'almas qismlari opasidagi zazor (tirqish)ni germetiklab, zichlovchi moslama.

Ushbu salnik yoki o'tkazuvchi elektr toki o'tkazish kabeli yoki simini asboblarning korpus tuzilishi bo'yicha bir tomoni konus Kabelga mo'ljallangan salnik tuzilishi bo'yicha bir tomoni konus Zichlovchi rezina halqa 4 va gaykadan tuzilgan.

Rezina qoplamli jgut (chilvir) ichiga joylashtirilgan kabel yoki sim gayka 3 buralganda halqa 4 bilan zichlanadi.



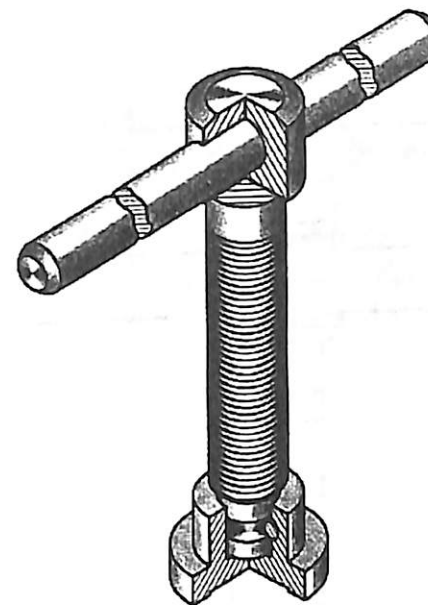
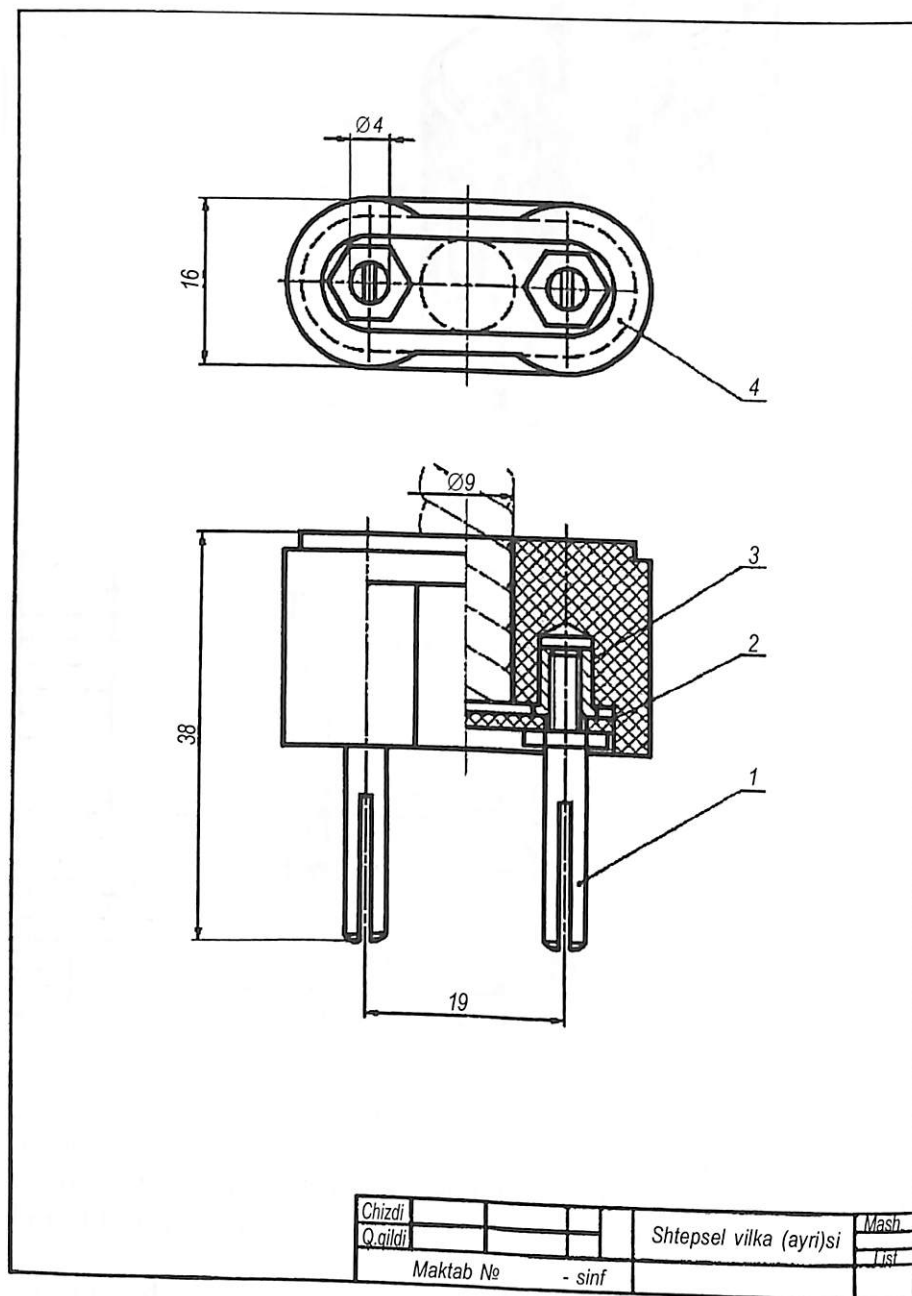
| O'ri            | Nomi               | Soni | Material                | Eslatma |
|-----------------|--------------------|------|-------------------------|---------|
|                 | Hujjatlar          |      |                         |         |
|                 | Yig'ish chizmasi   |      |                         |         |
|                 | Detallar           |      |                         |         |
| 1               | Tutashuv oyoqchasi | 2    | Jez L62                 |         |
| 2               | Qistirma           | 1    | Fibra                   |         |
| 3               | Vtulka             | 2    | Jez L62                 |         |
| 4               | Korpus             | 1    | Karbolit                |         |
|                 |                    |      |                         |         |
| Chizdi          |                    |      | Shtepsel vilka (ayri)si | Mash.   |
| Q.qildi         |                    |      |                         | List    |
| Maktab № - sinf |                    |      |                         |         |

## 8. Shtepsel vilkasi

Shtepsel vilkasi – shtepselli birikmaning bir qismi bo'lib, u qo'zg'almas qilib o'rnatilgan shtepsel rozetkasi (ulagich moslamasi) va ko'chma asboblardan bir qismi bilan sim orqali birlashtirilgan shtepsel vilkasidan iborat.

Shtepsel vilkasi korpusi 4dagi bo'ylama teshikka uchi tutashuv oyoqchalari 1 ga mahkamlanadigan shnur keltiriladi. Oyoqchalar korpusga presslab o'rnatilgan vtulka 3 ga burab kiritib mahkamlanadi.





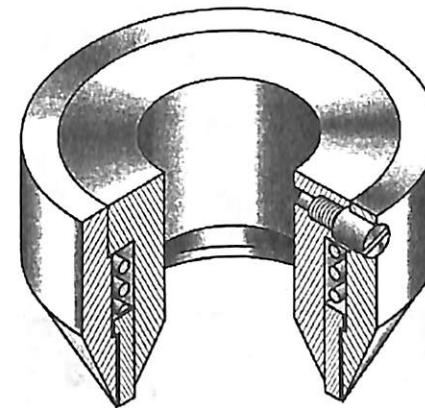
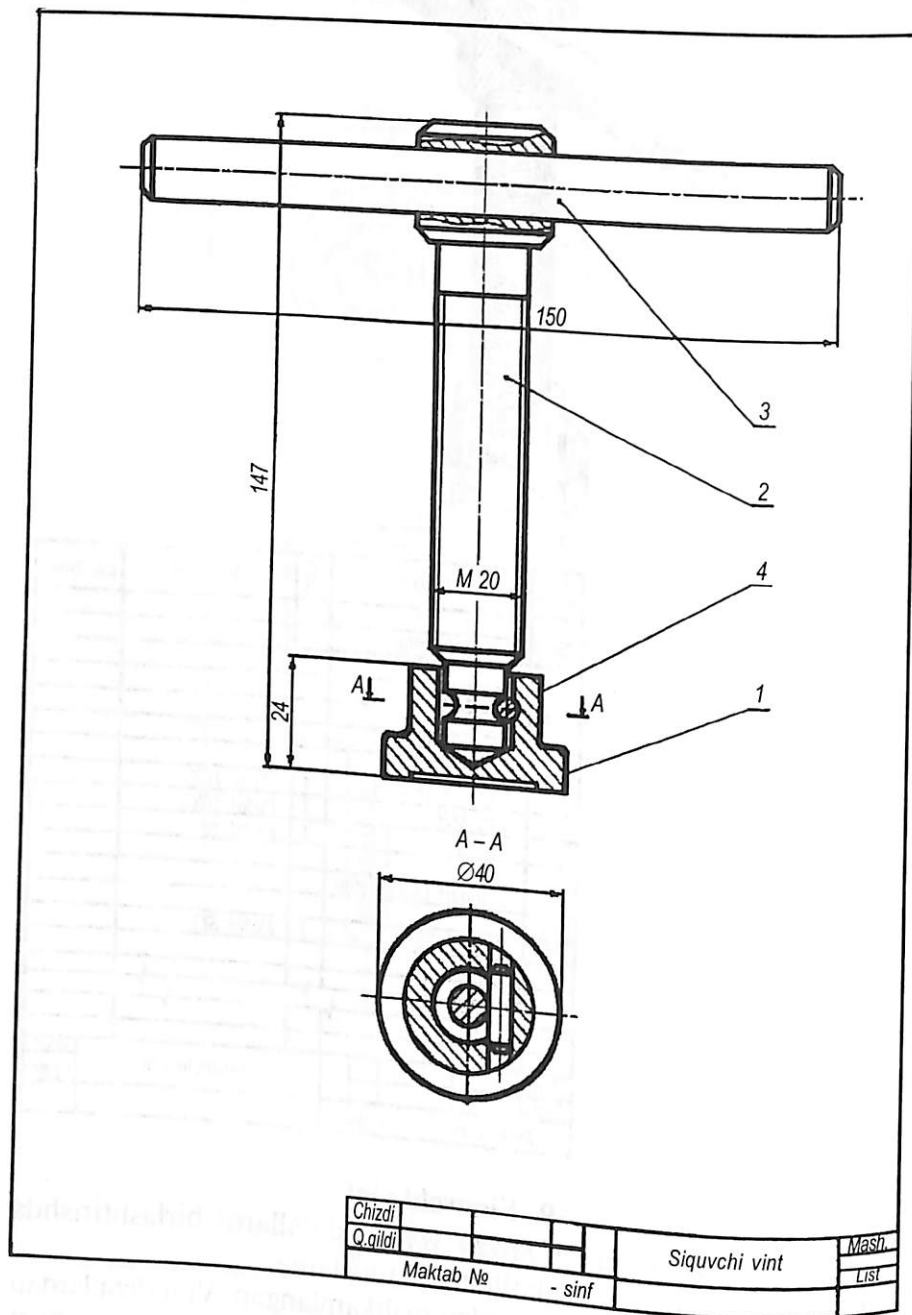
| O'mi     | Nomi                 | Soni | Material   | Eslatma       |
|----------|----------------------|------|------------|---------------|
|          | Hujjatlar            |      |            |               |
|          | Yig'ish chizmasi     |      |            |               |
|          | Detallar             |      |            |               |
| 1        | Tayanch (tovon)      | 1    | Po'lat 10X |               |
| 2        | Vint M20             | 1    | Po'lat 10X |               |
| 3        | Dasta                | 1    | Po'lat 10  |               |
|          | Standart mahsulotlar |      |            |               |
| 4        | Shtift 4x20          | 1    | Po'lat St3 |               |
| Chizdi   |                      |      |            |               |
| Qildidi  |                      |      |            |               |
| Maktab № |                      |      |            | - sinf        |
|          |                      |      |            | Siquvchi vint |
|          |                      |      |            | Mash.         |
|          |                      |      |            | List          |

### 9. Siquvchi vint

Qo'zg'almas dastali *siquvchi vint* — detallarni birlashtirishda cho'zish yoki siqishda ishlatiladigan moslama.

Vint 2 kallagiga dasta 3 presslab mahkamlangan. Vint detallardan biriga burab kiritilganidan keyin uning ikkinchi tarafidan shtift yordamida tayanch qo'shiladi.



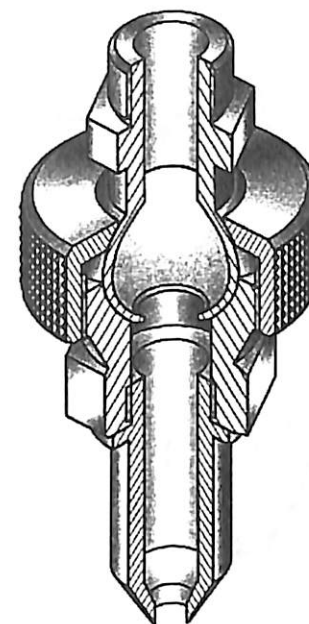
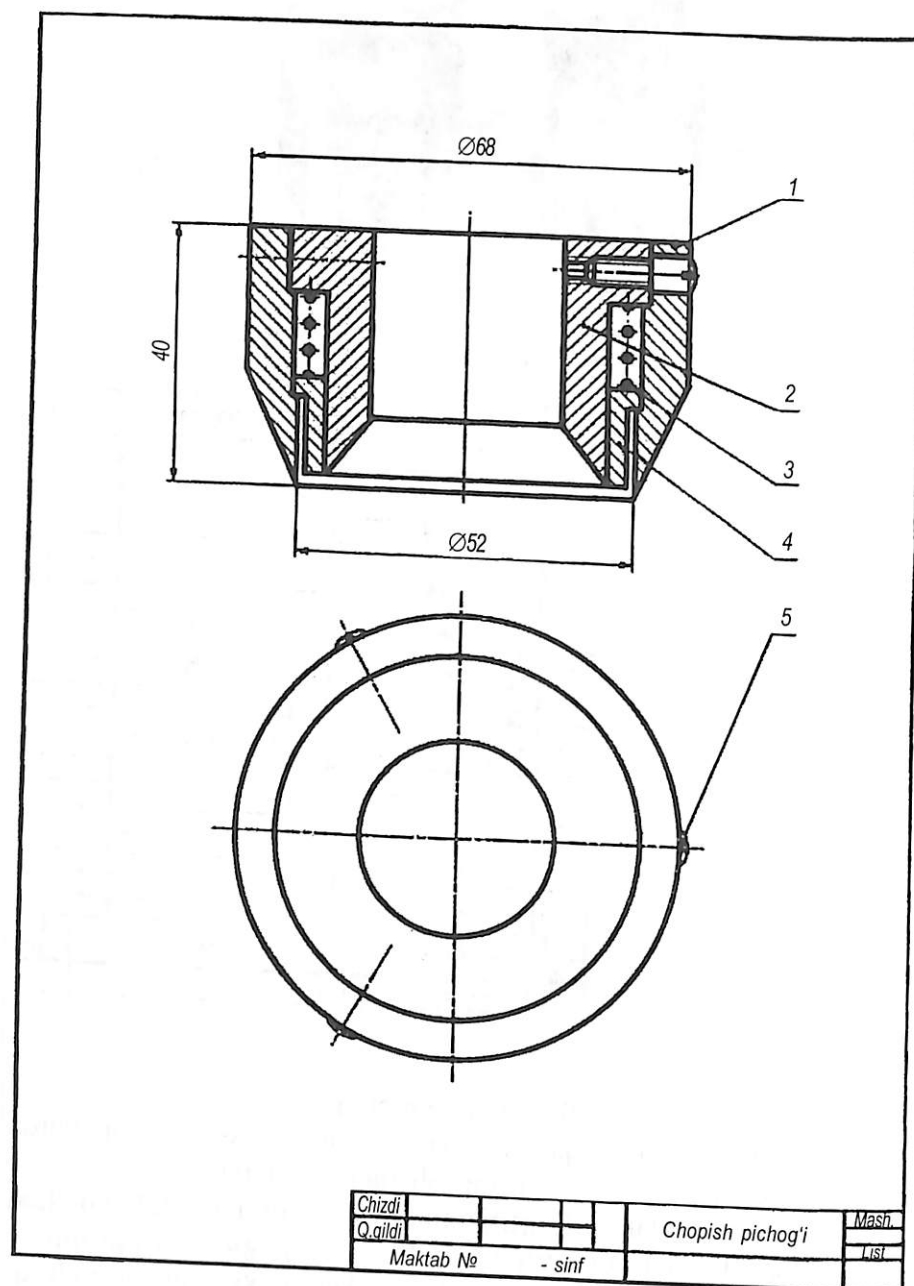


| O'ri            | Nomi                 | Soni | Material         | Eslatma |
|-----------------|----------------------|------|------------------|---------|
|                 | Hujjatlar            |      |                  |         |
|                 | Yiq'ish chizmasi     |      |                  |         |
|                 | Detallar             |      |                  |         |
| 1               | Tashqi pichoq        | 1    | Po'lat UVA       |         |
| 2               | Ichki pichoq         | 1    | Po'lat UVA       |         |
| 3               | Prujina              | 1    | Po'lat 65G       |         |
| 4               | Itarib chiqargich    | 1    | Po'lat 15        |         |
|                 | Standart mahsulotlar |      | Po'lat 15        |         |
| 5               | Vint M8              |      |                  |         |
|                 |                      |      |                  |         |
| Chizdi          |                      |      | Chopish pichog'i | Mash.   |
| Q. qildi        |                      |      |                  | List    |
| Maktab № - sinf |                      |      |                  |         |

## 10. Chopish pichog'i

Pichoq rezinadan halqasimon namunalarni maxsus mashinalarda sinovdan o'tkazish uchun qirqib olishga mo'ljallangan.

Uchta vint 5 bilan birlashtirilgan tashqi pichoq 1 va ichki pichoq 2 orasidagi halqasimon ariqchada itarib chiqargich 4 va prujina 3 joylashgan. Tepadan berilgan zarbadan keyin avval tashqi pichoq, undan keyin ichki pichoq rezinani qirqadi. Itarib chiqargich pichoqlardan kesilgan halqasimon namunani ajratadi.



| O'ri            | Nomi             | Soni | Material   | Eslatma |
|-----------------|------------------|------|------------|---------|
|                 | Hujjatlar        |      |            |         |
|                 | Yig'ish chizmasi |      |            |         |
|                 | Detallar         |      |            |         |
| 1               | Igna             | 1    | Po'lat 30X |         |
| 2               | Korpus           | 1    | Po'lat 30X |         |
| 3               | Qopqoq           | 1    | Po'lat 30X |         |
| 4               | Shar             | 1    | Po'lat 30X |         |
| Chizdi          |                  |      |            |         |
| Q.qildi         |                  |      |            |         |
| Maktab № - sinf |                  |      |            | Soplo   |
|                 |                  |      |            | Mash    |
|                 |                  |      |            | List    |

## 11. Soplo

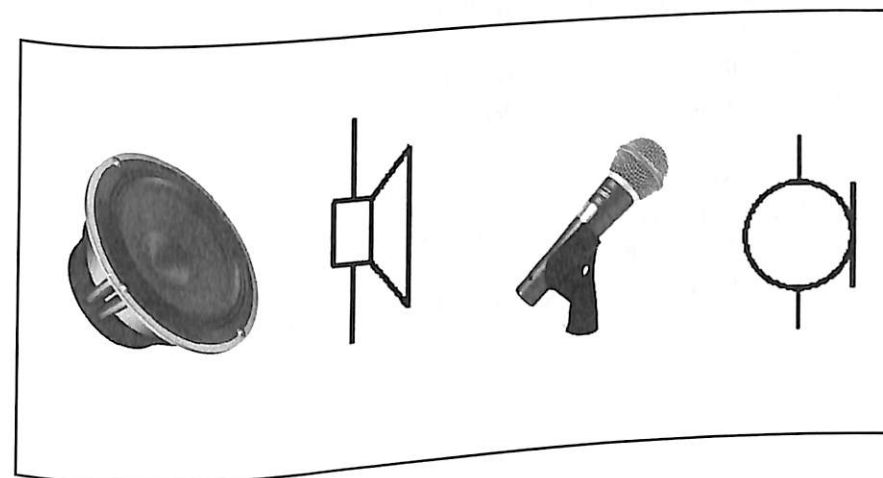
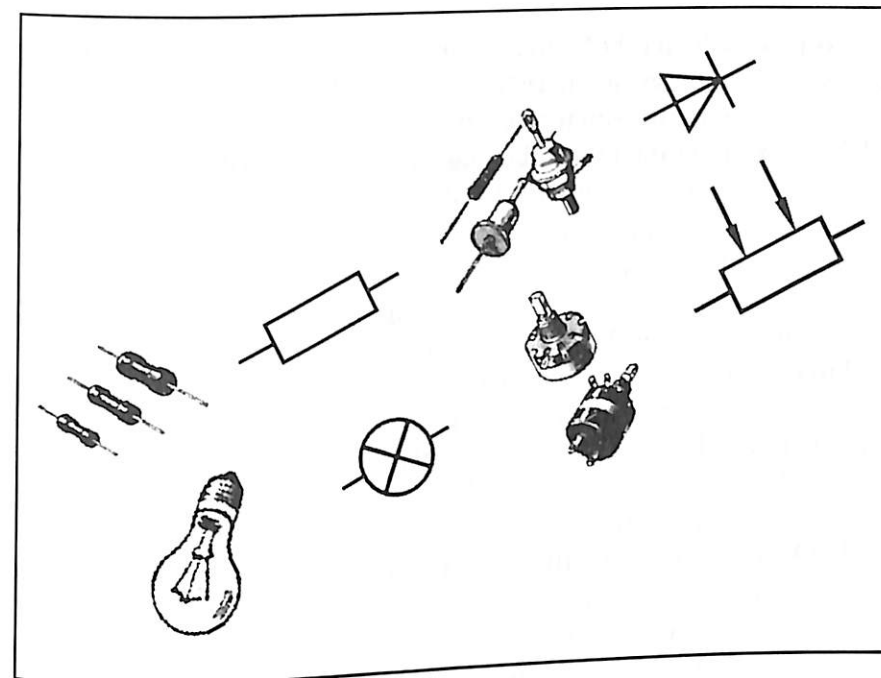
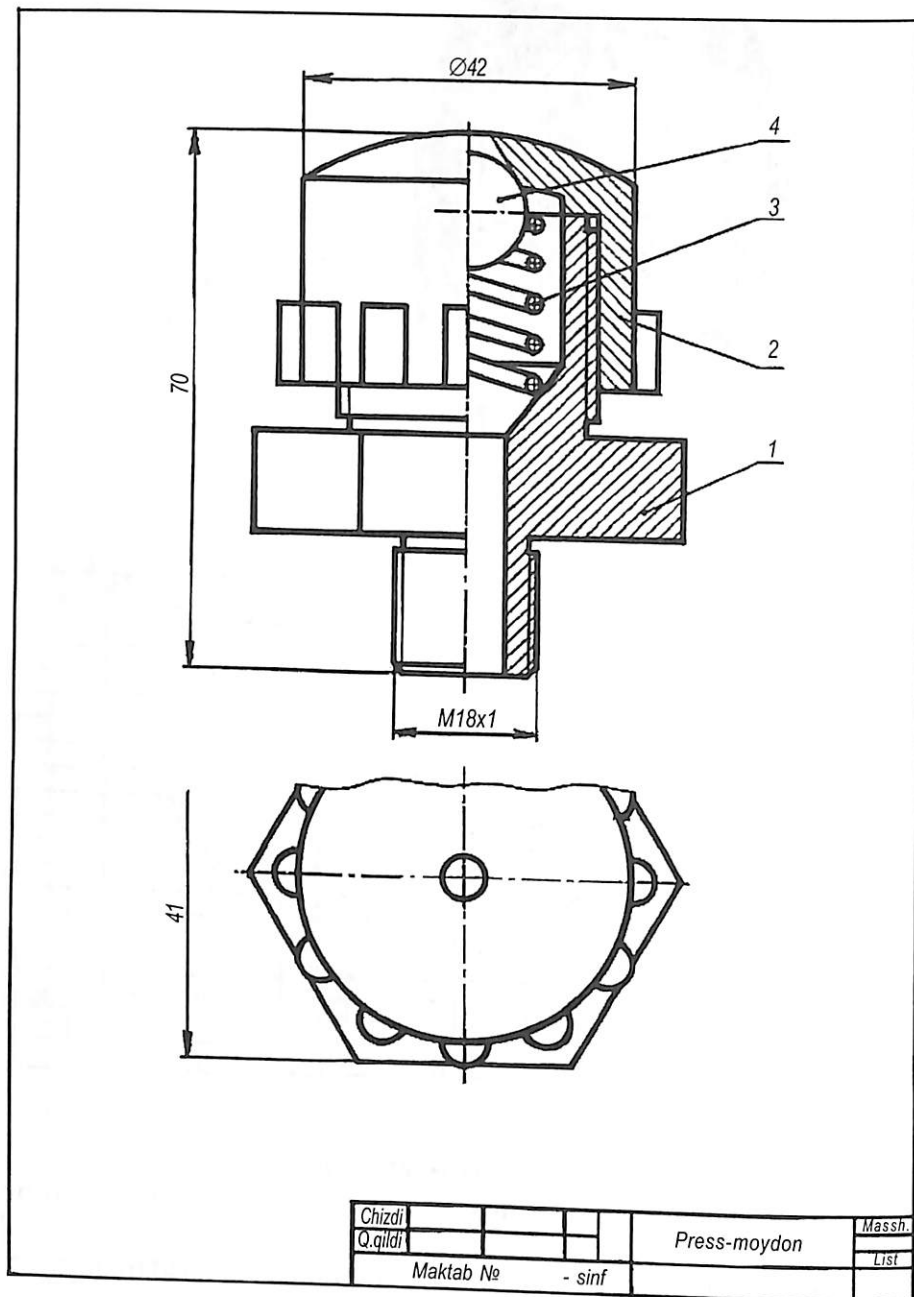
*Soplo* – oqib chiqayotgan suyuqlikni yo'naltirish va tezligini oshirishda qo'llaniladi.

Ushbu soplo katta tezlikda aylanadigan silliqlovchi diskka sovituvchi suyuqlik uzatishda qo'llaniladi.

Shar 4 ning korpus 2 bilan sharli birikmasi suyuqlik oqimi yo'nalishini igna 1 yordamida o'zgartirishga imkon beradi. Qopqoq 3 korpus bilan rezbali birikkan va sharli birikmani tutib turadi.



# V QISM. SXEMALAR



## 24-topshiriqning qisqacha bayoni

### 24-topshiriq. Elektr sxemalari chizmasini bajarish

Ko'p yo'nalishlar bo'yicha mutaxassislar tayyorlashda o'quvchilarni elektr sxemalarni bajarishga o'rgatish ko'zda tutilgan. O'quvchilar darslikdan prinsipial elektr sxemalarini bajarishga qo'yiladigan talablar, sxemalarda qo'llaniladigan shartli grafik belgilar, shuningdek, elementlarning tuzilishi va ishlash prinsipiga tegishli elementar ma'lumotlar va ularni bajarishga doir materiallarni o'rganganlaridan keyin topshiriqni bajarishga kirishadilar.

Topshiriqlarda o'quvchilarda kundalik turmushda uchrayb turadigan, tanish bo'lgan elementlarni o'z ichiga olgan variantlar tanlangan. Topshiriqni bajarishdan maqsad sxematik chizmalar bajarishning o'ziga xos xususiyatlarini o'rganish va o'quvchilarni sxemalarda ishlatiladigan shartli belgilar bilan tanishtirishdan iborat.

Topshiriq A3 yoki A4 formatli chizma qog'ozida quyidagi ketma-ketlikda bajariladi:

1. Darslik yoki standartlardan prinsipial elektr sxemalariga tegishli ma'lumotlar o'rganiladi.

2. Sxemalar tushunarli, o'qish uchun qulay va ixcham bajarilishi kerak. Sxemalardagi bog'lanish chiziqlarining qayrilish va ularning o'zaro kesishish joylari iloji boricha kam bo'lishi kerak. Qo'shni joylashgan parallel chiziqlar orasidagi masofa 3 mm dan kam bo'lmashi kerak.

3. Chizma ramkasini chizib, asosiy yozuvni bajaring. Asosiy yozuv tepasidagi joydan tafsilotli ro'yxat uchun bo'sh o'rin qoldiring.

4. Uzib qo'yilgan holatdagi sxemani chizing, bunda chiziqlar 0,2–0,6 mm qalinlikda tanlanadi. Har bir element harf-raqamli pozitsion belgiga ega bo'lishi kerak.

5. Elementlar ro'yxati keltirilgan jadvalni to'ldiring.

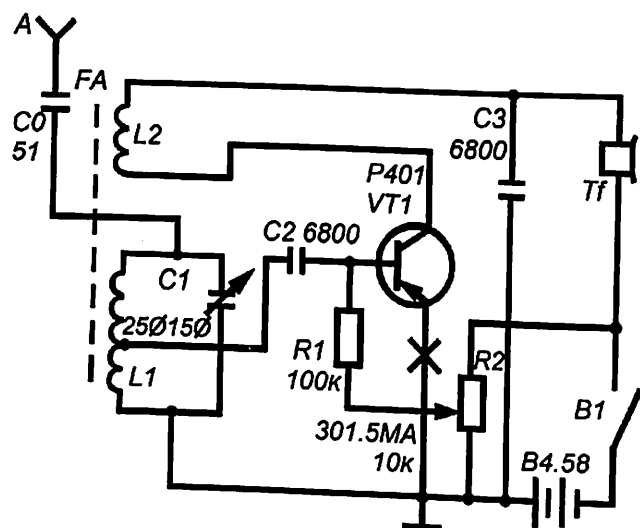
## 24-topshiriq – «Elektr sxemalari chizmasini bajarish» namunasi

| Belgi-<br>nishi | Nomi                                                | Soni | Izoh               |
|-----------------|-----------------------------------------------------|------|--------------------|
| FU1 FU2         | Enuvchan to'ldirgichli PVD1-23 saqlagich PRS-BUZ-ps | 2    |                    |
| M               | PVD1-2U3                                            |      |                    |
|                 | Harakatlantirgich (divigatel) 4A8QA6U3              | 1    | n=100<br>OB<br>MON |
| KM              | Ishga tushirgich PML-12300                          | 1    | N=0,75 kBrn        |
|                 | Transformator OSM-0, 063U3 220/369                  | 1    |                    |
|                 | Lampa KM 48/50GOST6940-74                           | 2    | AME-32322          |
|                 | Avtomatik o'chirib qo'ygich (vilyuchetel) BA-5125   | 1    |                    |
| SB1             | Elektr issiqlik rele'si                             | 1    |                    |

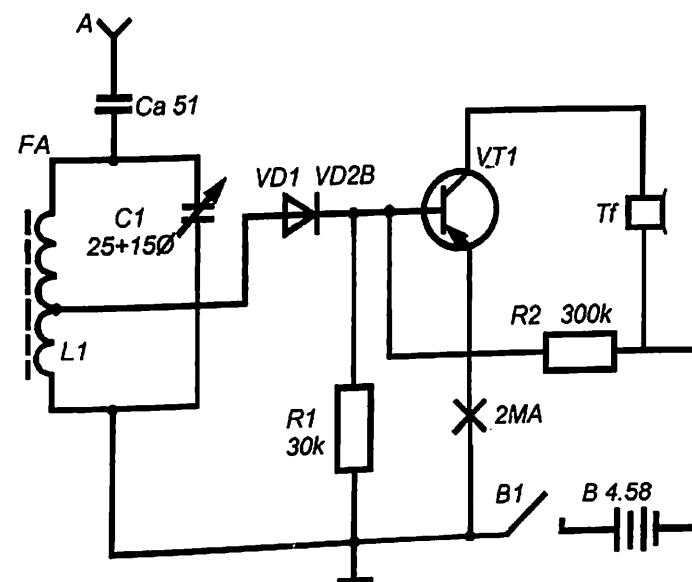
  

| Chizma<br>Sohibiga<br>Berilgan<br>O'qilgan | Uzroq<br>Sana | Prinsipial elektrik<br>sxema |
|--------------------------------------------|---------------|------------------------------|
|                                            |               |                              |

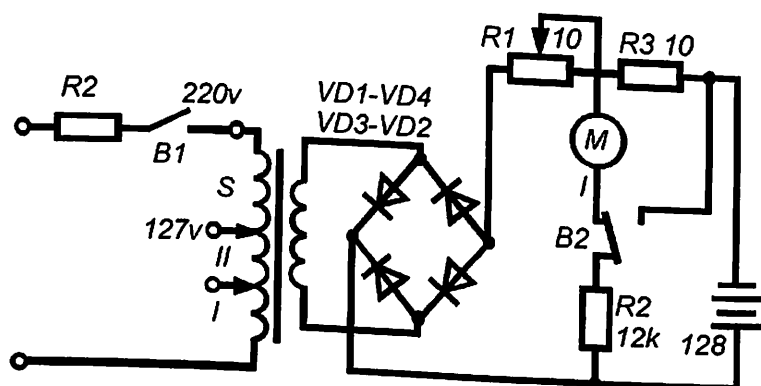
1-variant



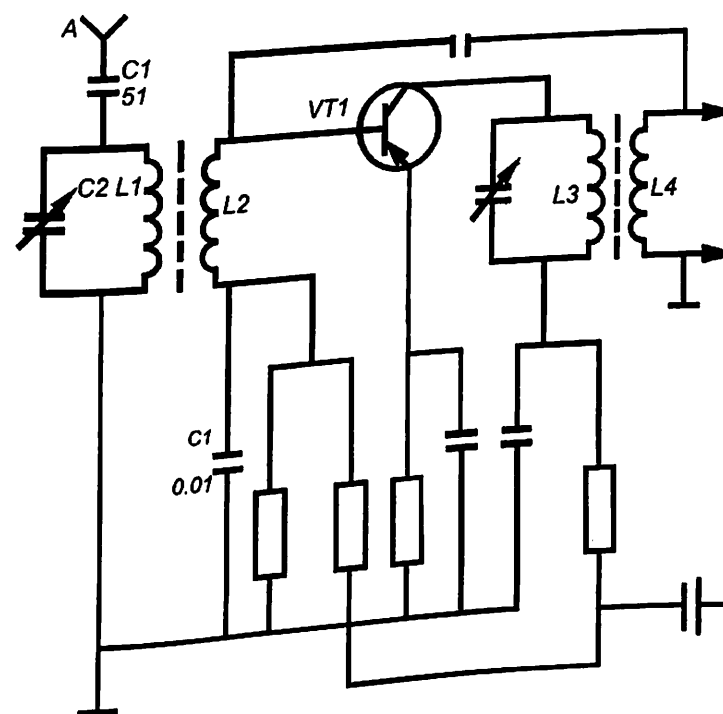
3-variant



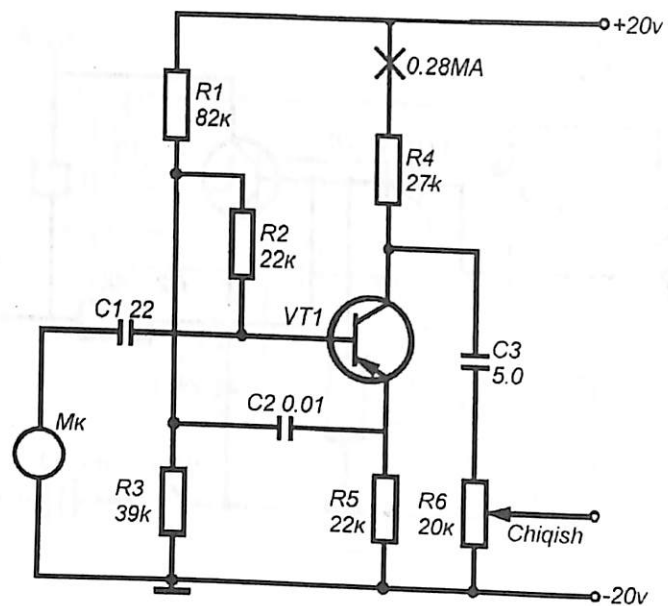
2-variant



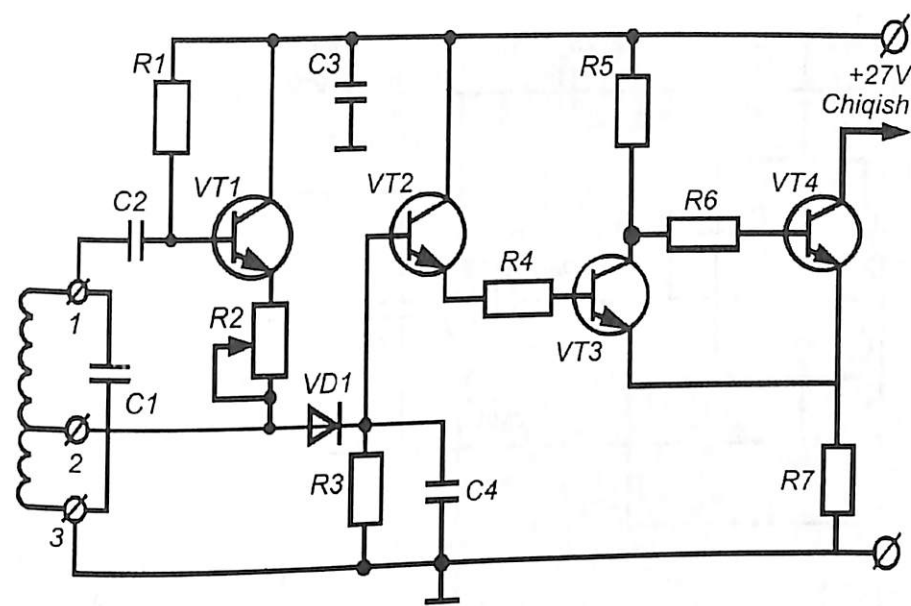
4-variant



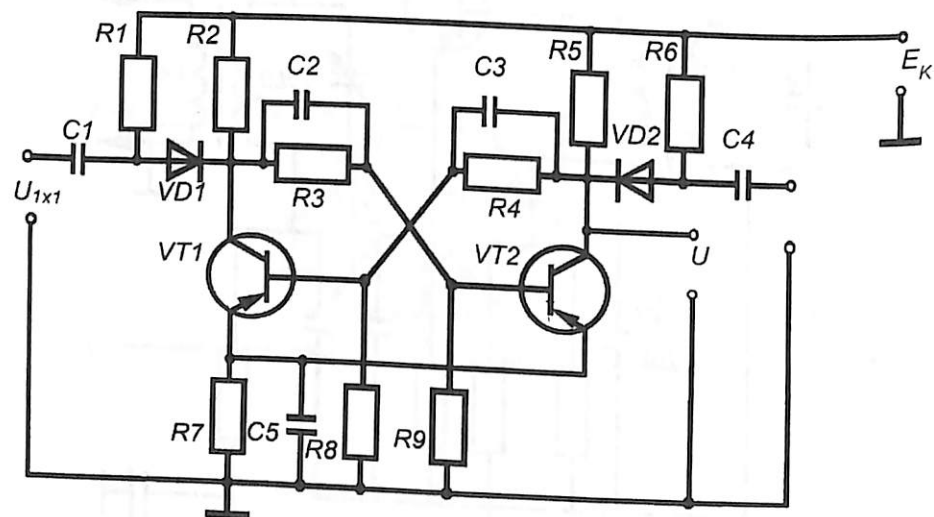
5-variant



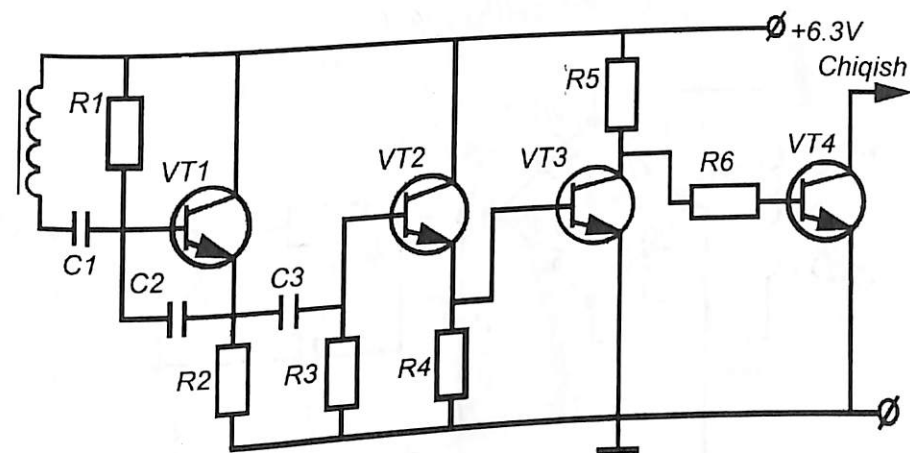
7-variant



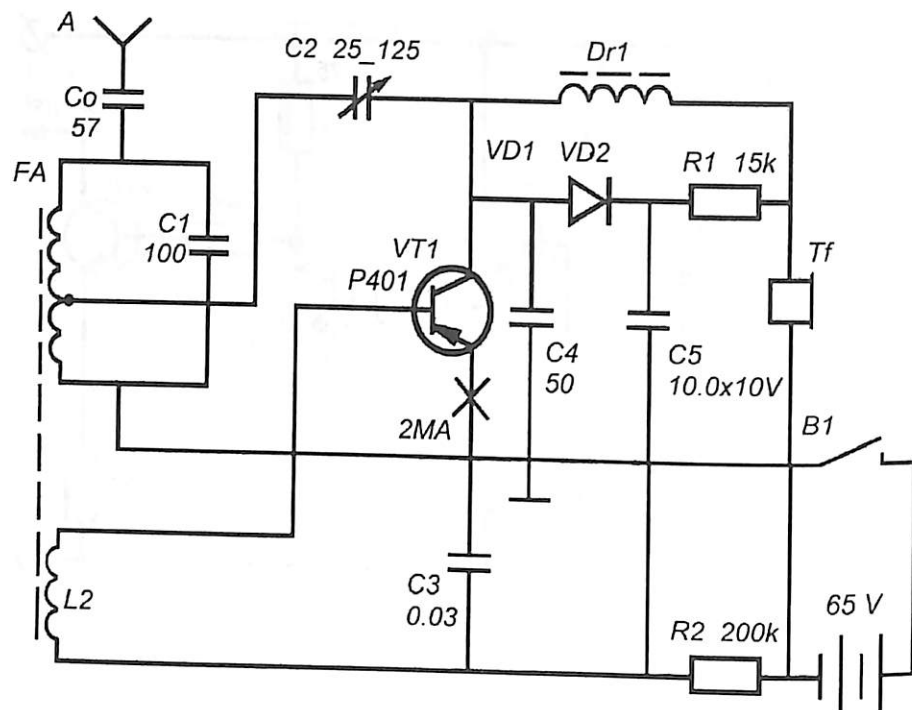
6-variant



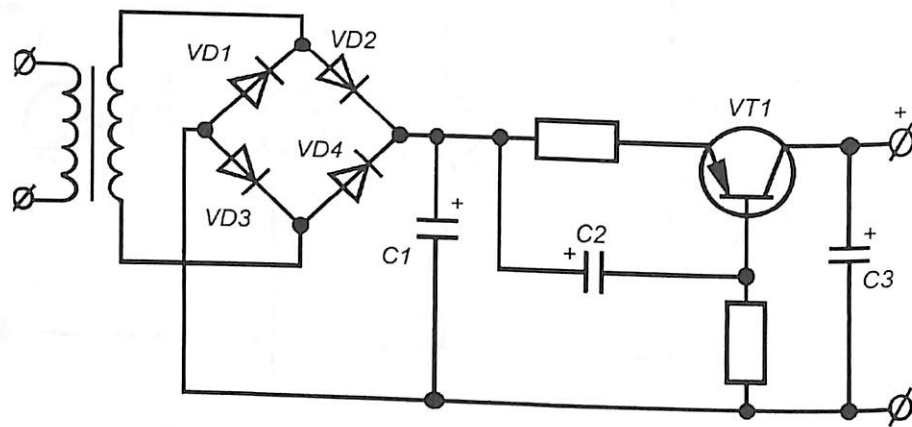
8-variant



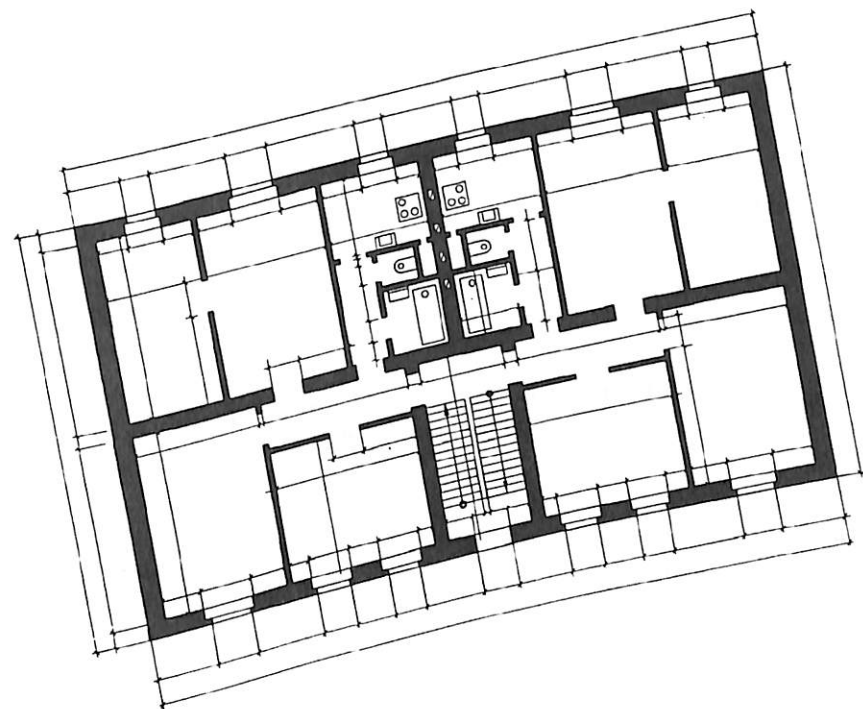
9-variant



10-variant



## VI QISM. ARXITEKTURA-QURILISH CHIZMACHILIGI





## 25–26-topshiriqlarning qisqacha bayoni

### 25-topshiriq. Bino plani chizmalarini o'qish. Tom plani chizmasini bajarish

1. Berilgan perspektiv tasvirga asosan tasvirlangan bino planini aniqlang.
2. Aniqlangan tasvirda xonalarni raqamlar bilan belgilab chiqing va ularning tafsilotli ro'yxatini (eksplikatsiya) tuzing.

#### Tafsilotli ro'yxat (eksplikatsiya)

|       |       |
|-------|-------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

3. Har bir plandagi eshik va derazalarning turlarini aniqlang, javoblarni jadvalga yozing.

| № | Eshiklar soni | Eshiklar turi va ularning soni | Derazalar soni | Derazalar turi va ularning soni |
|---|---------------|--------------------------------|----------------|---------------------------------|
| 1 |               |                                |                |                                 |
| 2 |               |                                |                |                                 |
| 3 |               |                                |                |                                 |

4. Perspektiv tasvir va bino planiga asosan tom planini aniqlang va uning chizmasini bajaring.

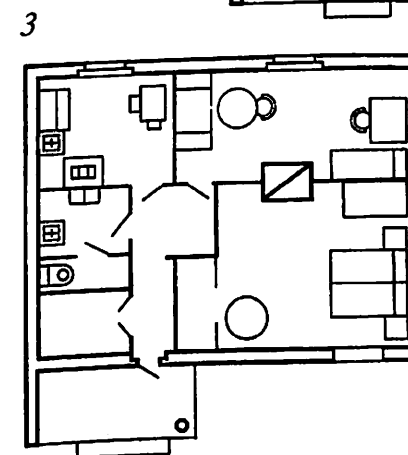
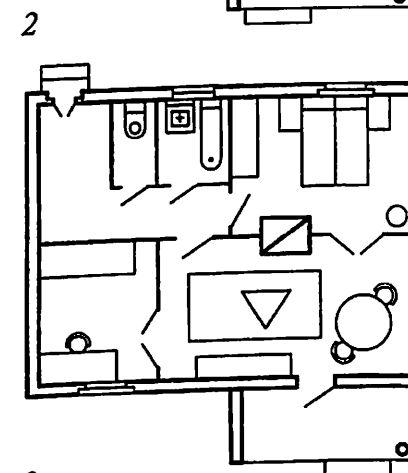
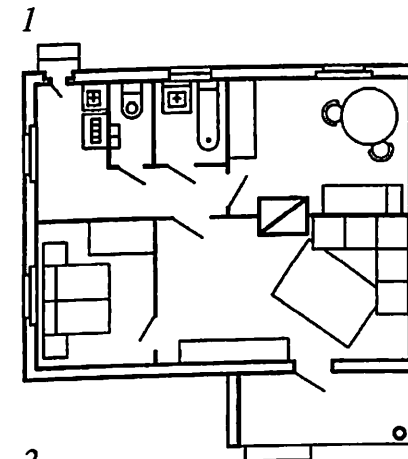
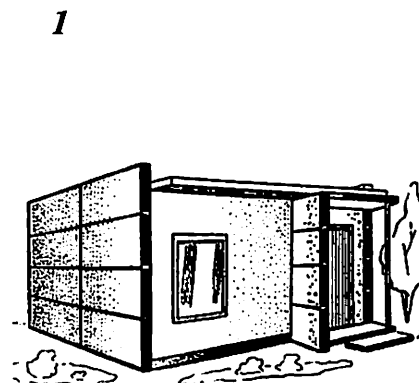
5. Binoning asosiy (bosh) fasadini aniqlang va uni perspektiv tasvirda belgilang.

### 26-topshiriq. Bino plani, fasadi va qirqimi chizmasini bajarish

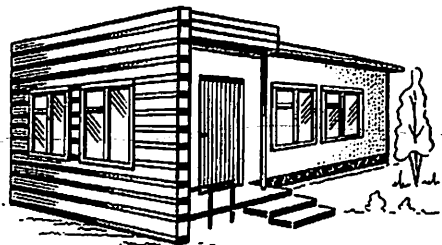
Tasvirlarda bino fasadi va qirqimining tugallanmagan chizmalari hamda planining sxemashtirilgan chizmasi keltirilgan. Eshik va deraza o'rinlarining o'lchamlari jadvalda berilgan.

Keltirilgan ma'lumotlardan foydalanib, bino plani, fasadi va qirqimi chizmalarini yakunlang.

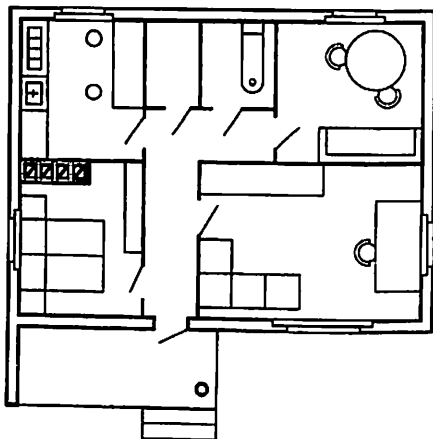
## 25-topshiriq variantlari



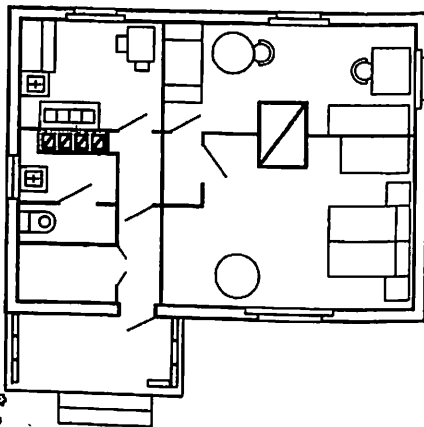
2



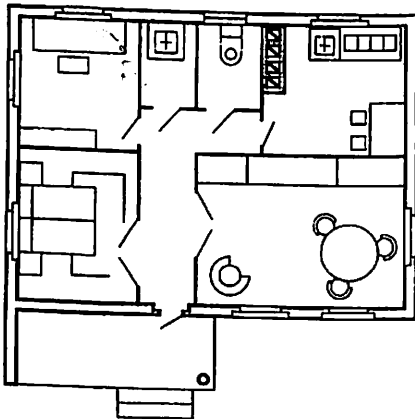
1



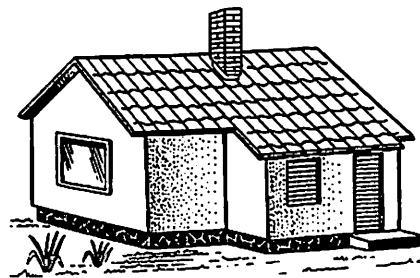
2



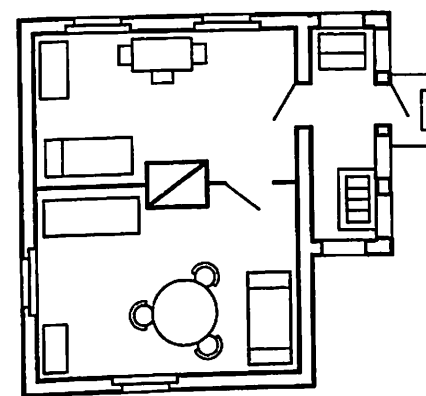
3



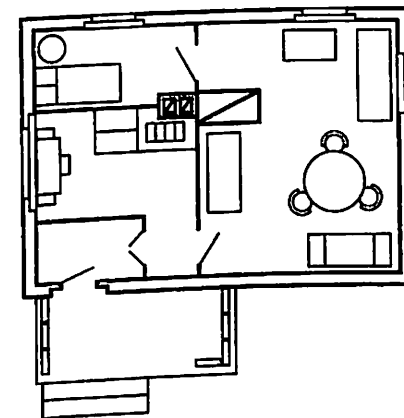
3



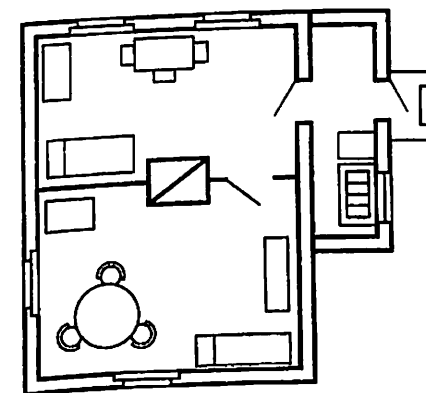
1



2



3

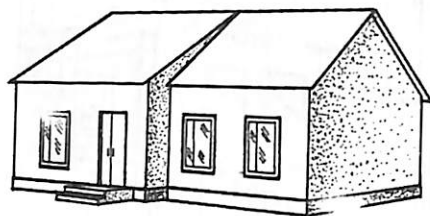


7-10000 AB 75

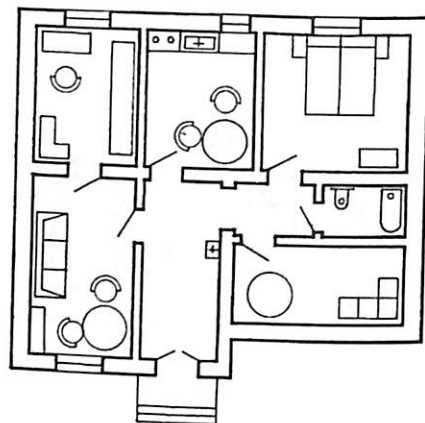
План.

2

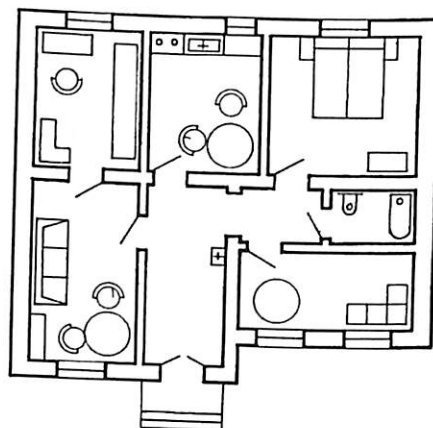
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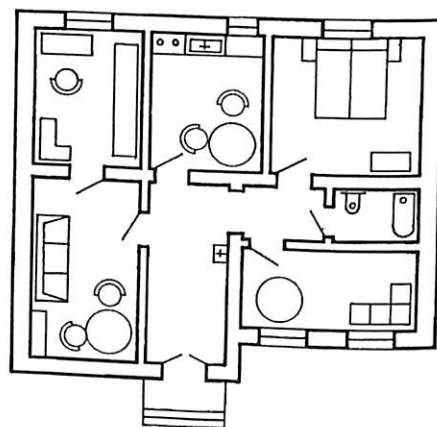
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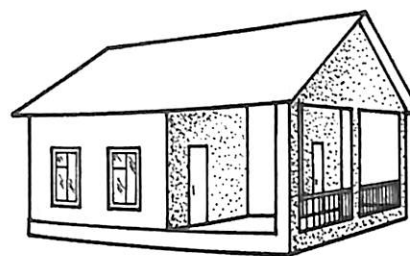
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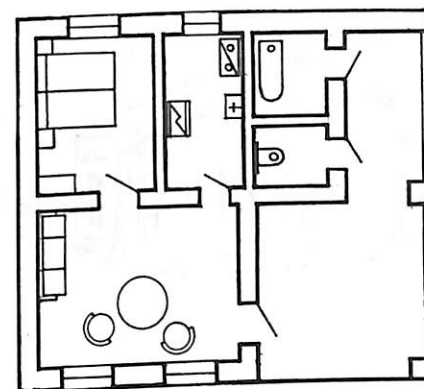
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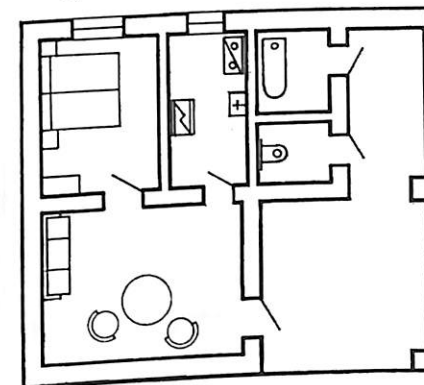
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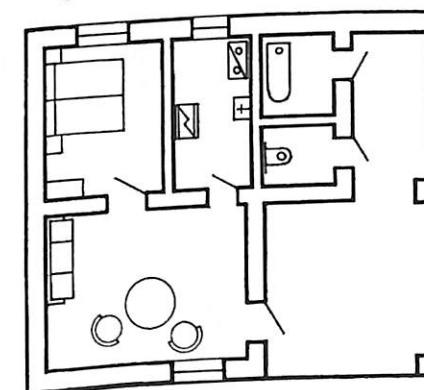
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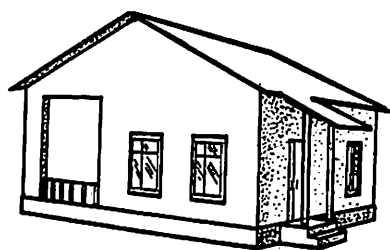
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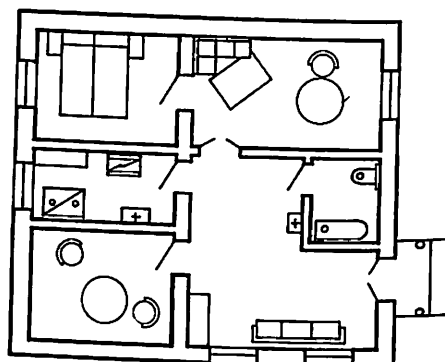
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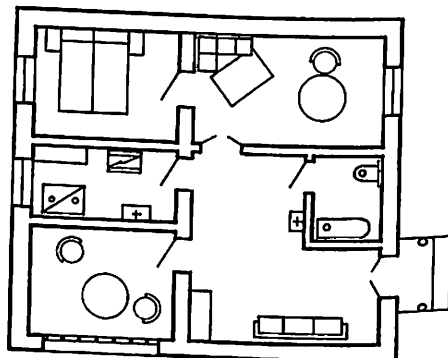
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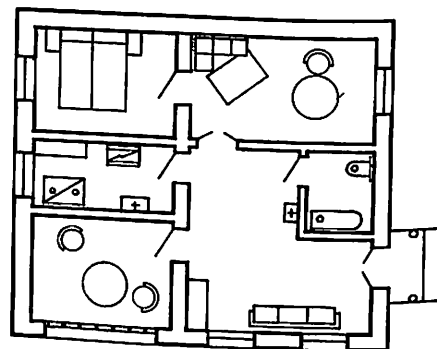
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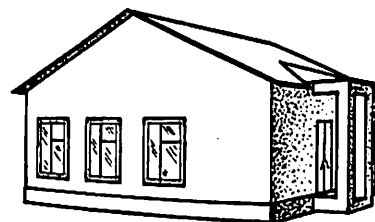
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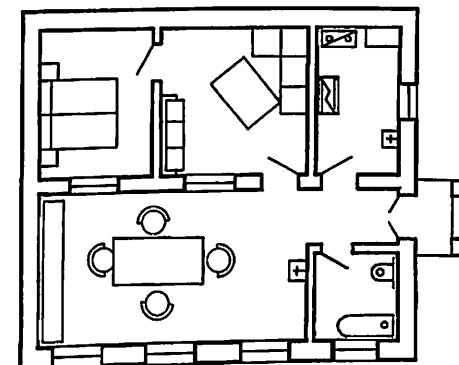
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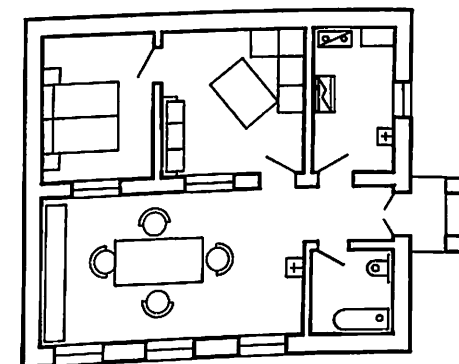
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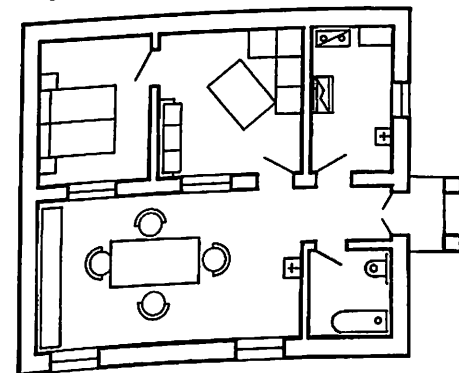
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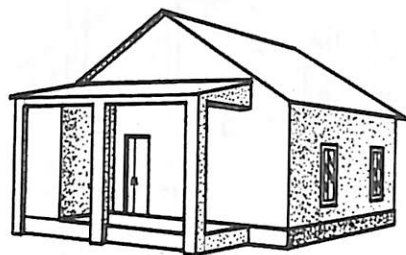
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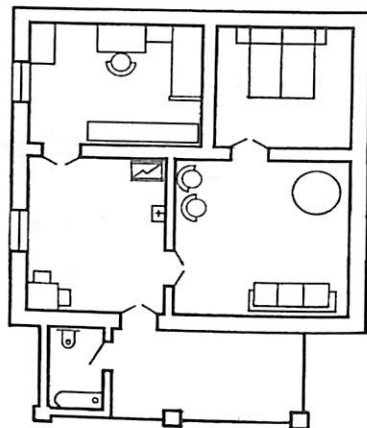
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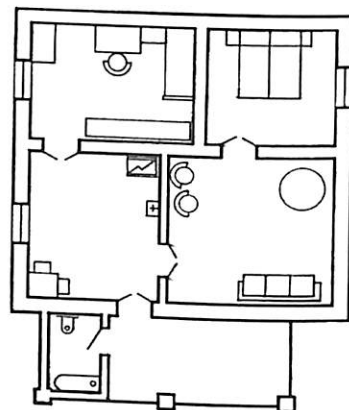
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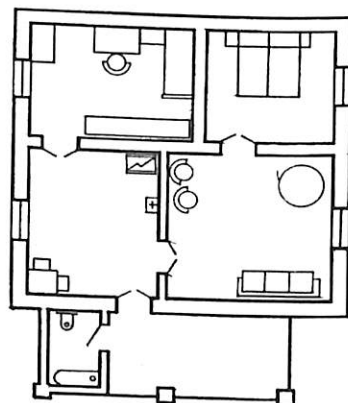
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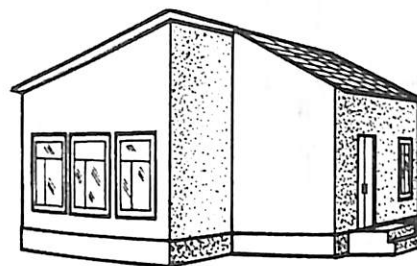
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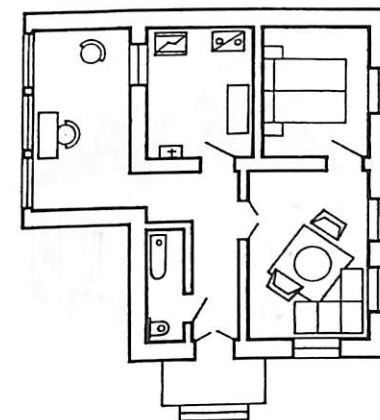
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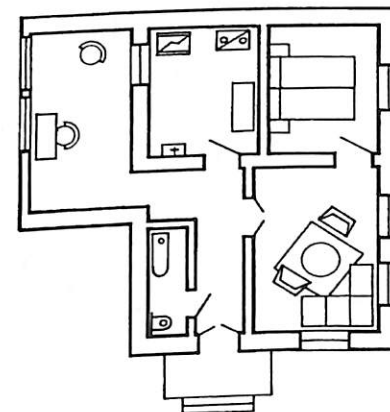
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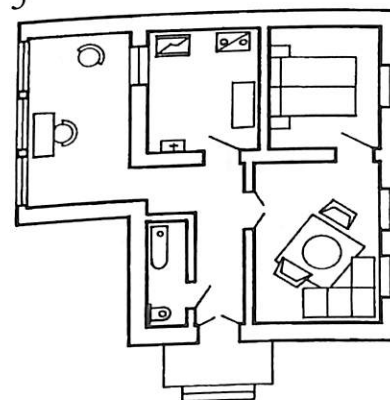
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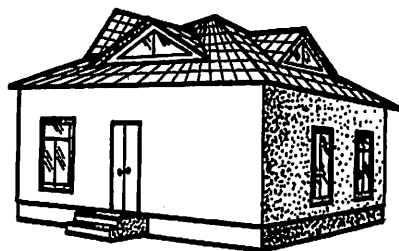
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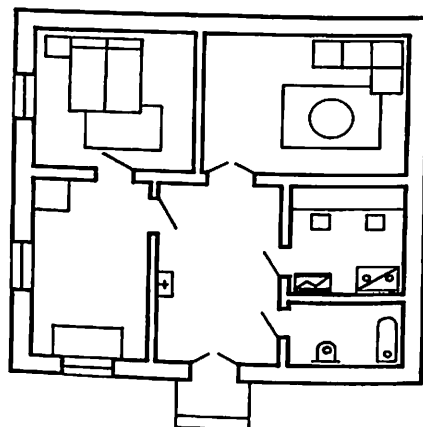
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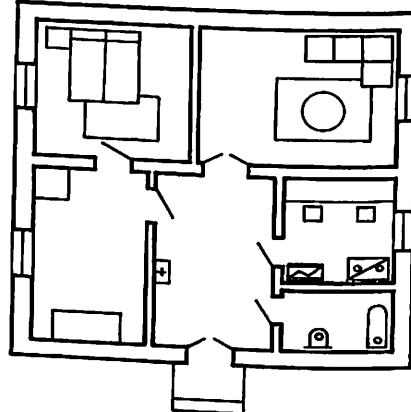
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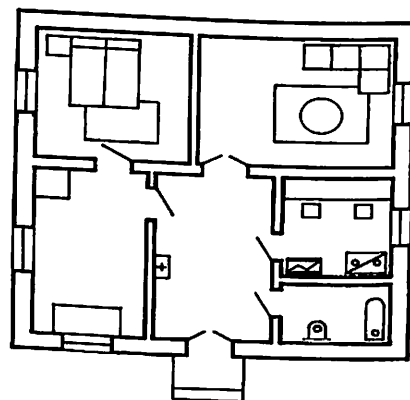
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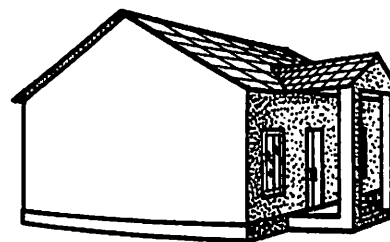
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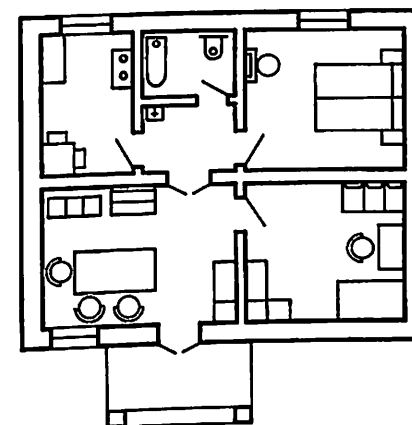
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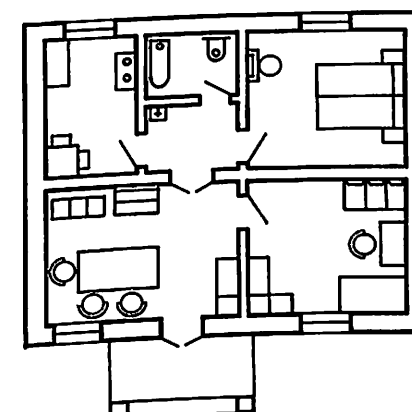
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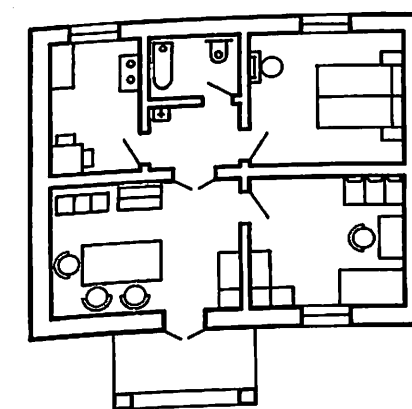
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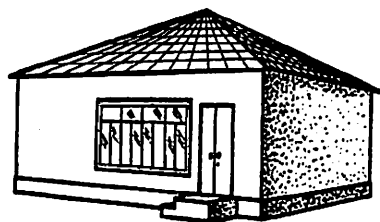


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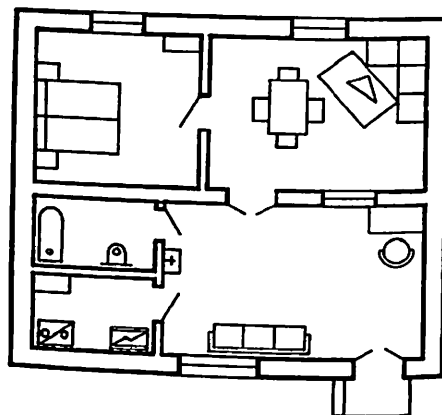


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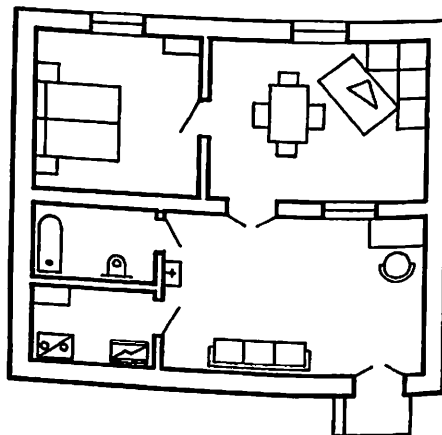




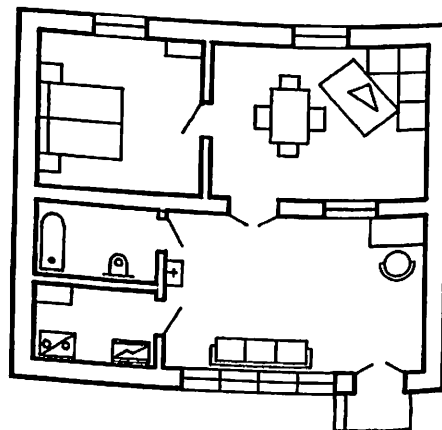
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2

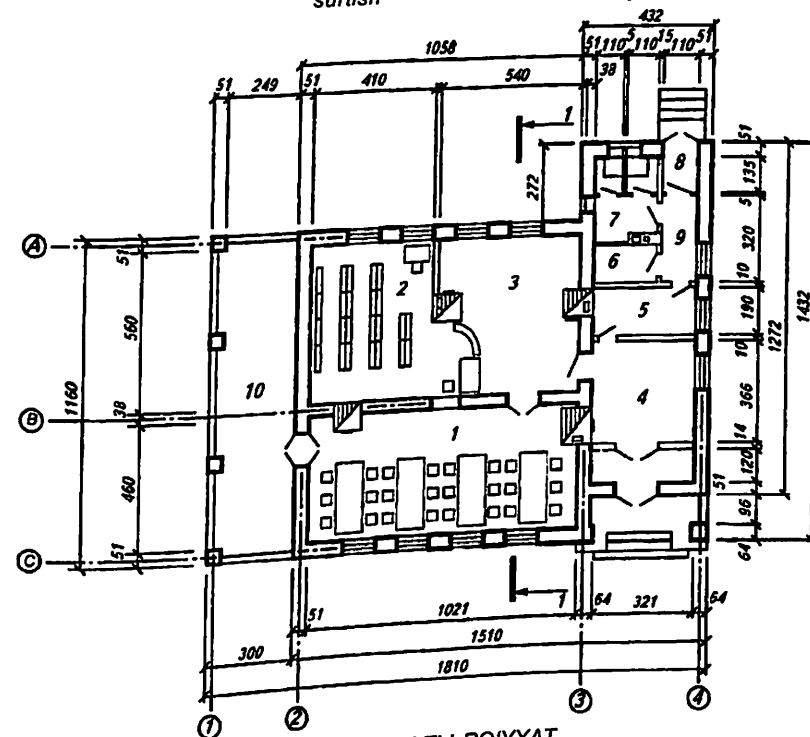
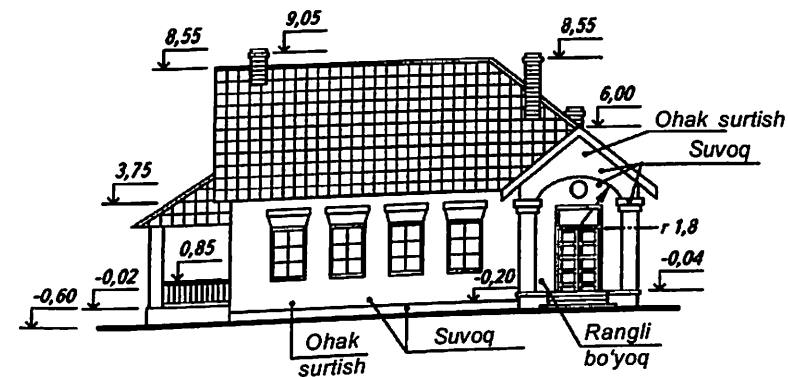


3



## 26-topshiriq — «Bino plani, fasadi va qirqimi chizmasini bajarish» namunasi

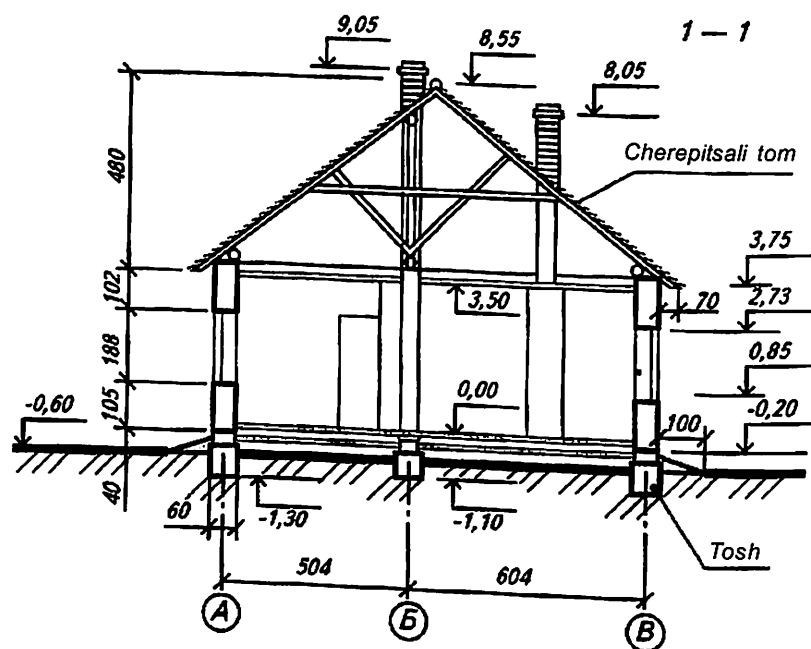
Qishloq axborot-resurs markazi binosi  
fasadi va plani



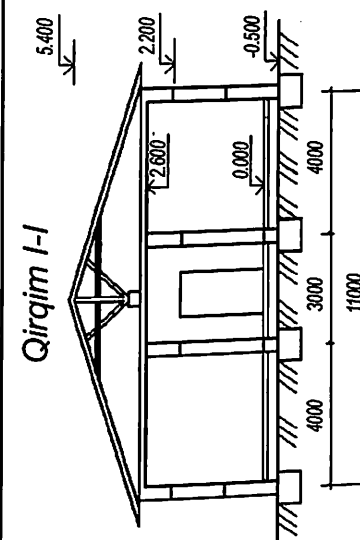
TAFSILOTI RO'YXAT

|                       |                      |                    |                      |
|-----------------------|----------------------|--------------------|----------------------|
| 1. O'quv zali         | 45,21 m <sup>2</sup> | 6. Omborxona       | 3,15 m <sup>2</sup>  |
| 2. Kitob saqlash joyi | 26,32 m <sup>2</sup> | 7. Hojatxona       | 6,53 m <sup>2</sup>  |
| 3. Abonement          | 28,65 m <sup>2</sup> | 8. Dahliz          | 1,50 m <sup>2</sup>  |
| 4. Vestibul           | 17,00 m <sup>2</sup> | 9. Yo'lak          | 3,62 m <sup>2</sup>  |
| 5. Chekish joyi       | 6,65 m <sup>2</sup>  | 10. Oynavand ayvon | 33,80 m <sup>2</sup> |

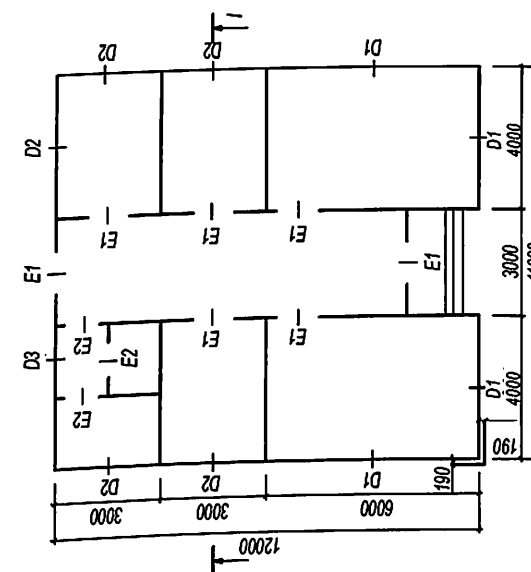
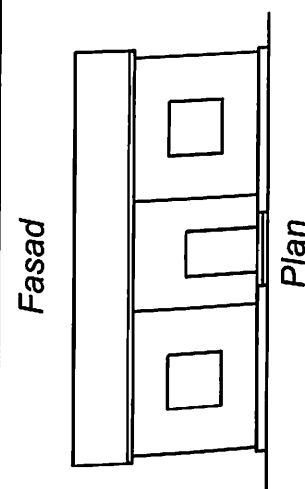
*Qishloq axborot-resurs markazi binosi qirgimi*



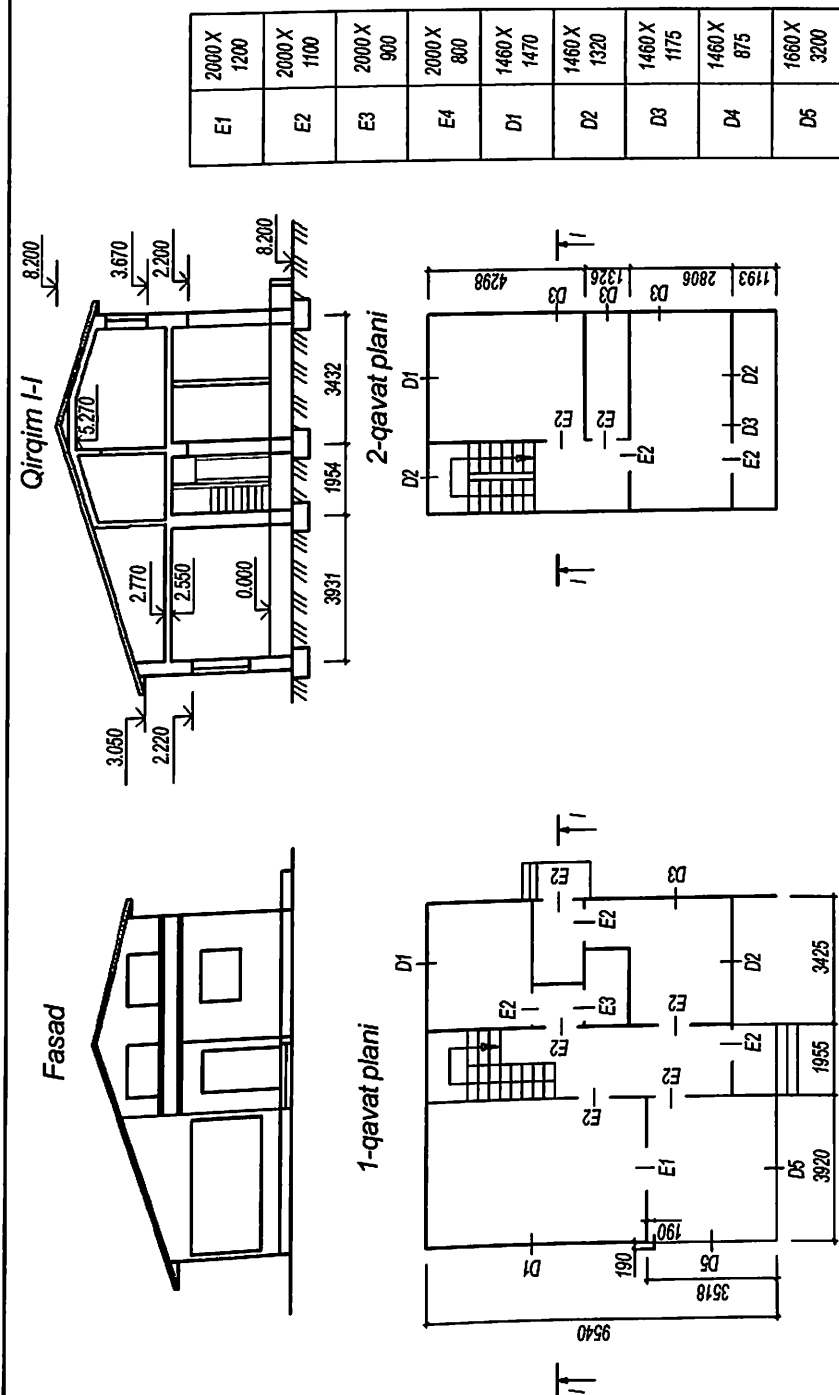
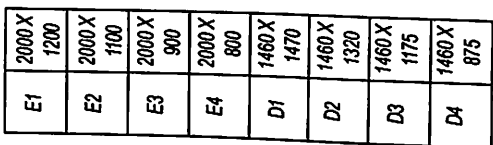
### 26-topshiriq variantlari



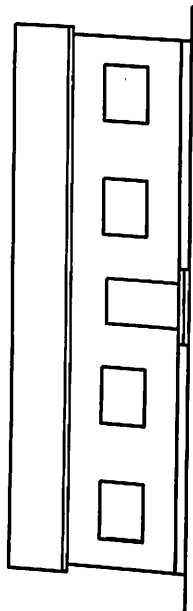
| E1             | E2             | E3             | E4            |
|----------------|----------------|----------------|---------------|
| 2000 X<br>1200 | 2000 X<br>1100 | 2000 X<br>900  | 2000 X<br>800 |
| D1             | D2             | D3             | D4            |
| 1460 X<br>1475 | 1460 X<br>1320 | 1460 X<br>1175 | 1460 X<br>875 |



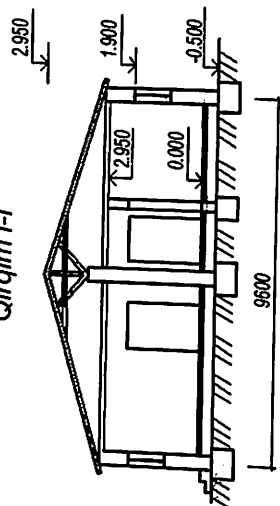




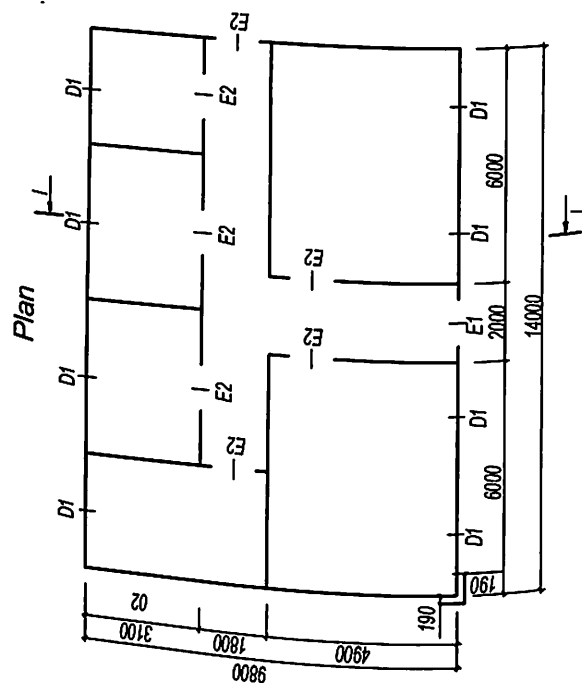
Fasad



Qirgim I-I

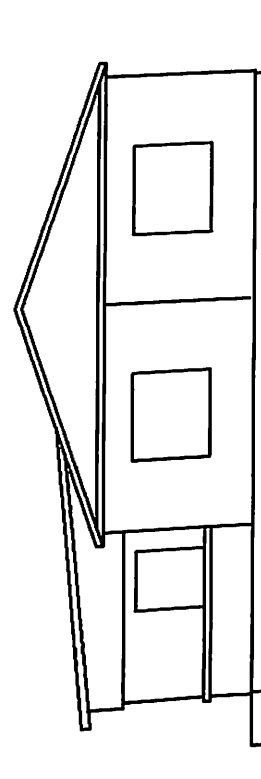


Plan

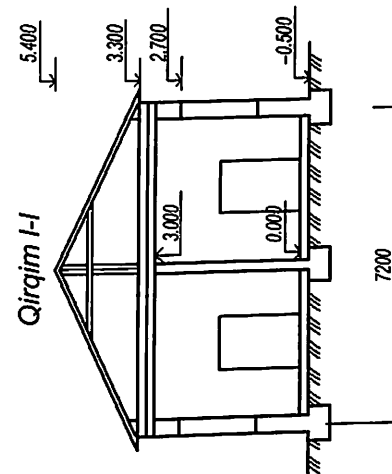


| E1             | E2             | E3             | E4            |
|----------------|----------------|----------------|---------------|
| 2000 X<br>1200 | 2000 X<br>1100 | 2000 X<br>900  | 2000 X<br>800 |
| D1             | D2             | D3             | D4            |
| 1460 X<br>1475 | 1460 X<br>1320 | 1460 X<br>1175 | 1460 X<br>875 |

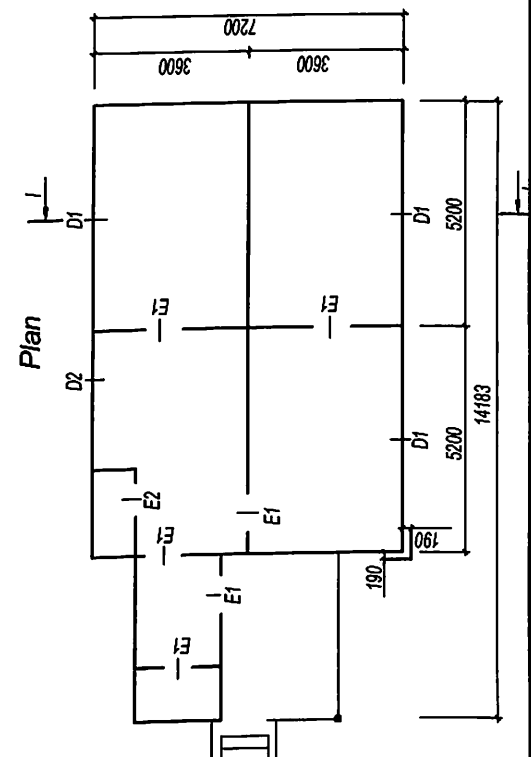
Fasad



Qirgim I-I

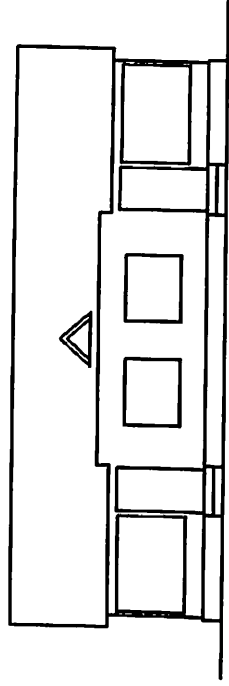


Plan

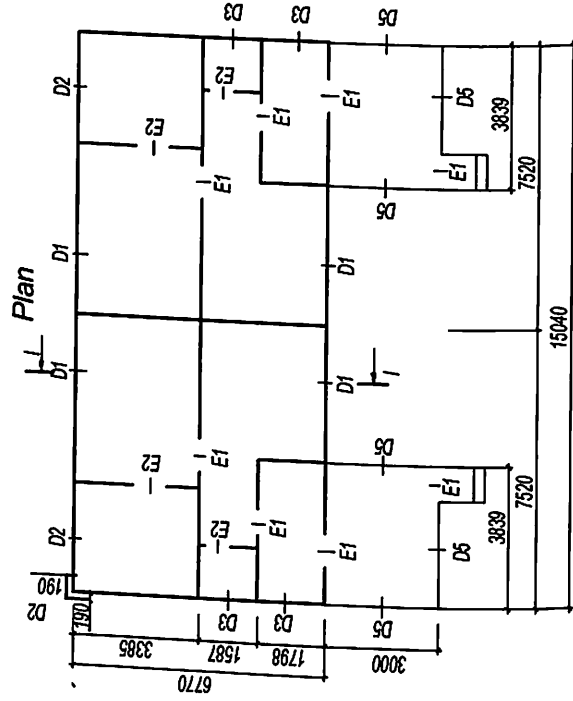
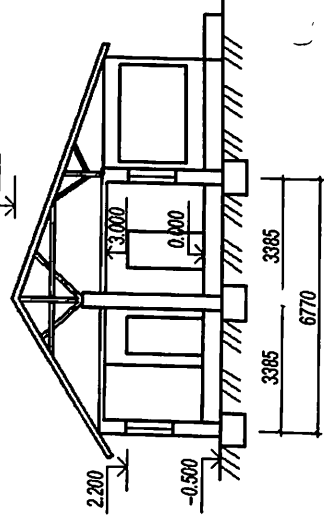


| E1             | E2             | E3             | E4            |
|----------------|----------------|----------------|---------------|
| 2000 X<br>1200 | 2000 X<br>1100 | 2000 X<br>900  | 2000 X<br>800 |
| D1             | D2             | D3             | D4            |
| 1460 X<br>1475 | 1460 X<br>1320 | 1460 X<br>1175 | 1460 X<br>875 |

Fasad

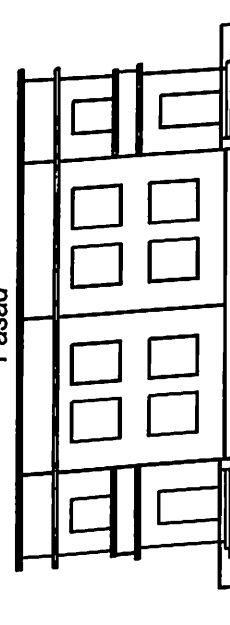


Qirgim I-I 4.960

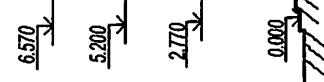


| E1          | E2          | E3          | E4         |             |
|-------------|-------------|-------------|------------|-------------|
| 2000 X 1200 | 2000 X 1100 | 2000 X 900  | 2000 X 800 |             |
| D1          | D2          | D3          | D4         | D5          |
| 1460 X 1475 | 1460 X 1320 | 1460 X 1175 | 1460 X 875 | 1660 X 3200 |

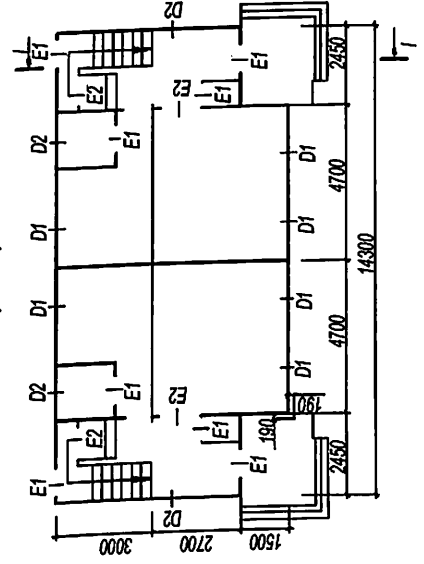
Fasad



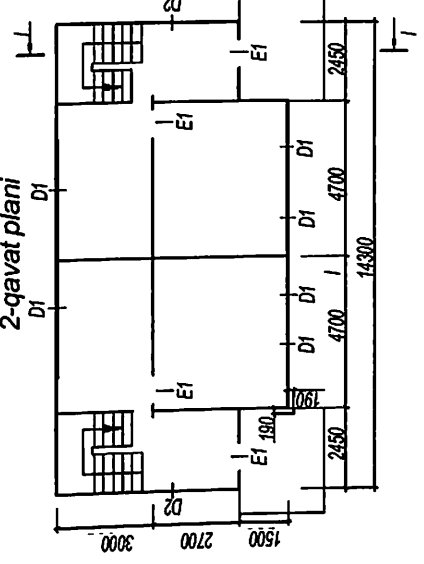
Qirgim I-I



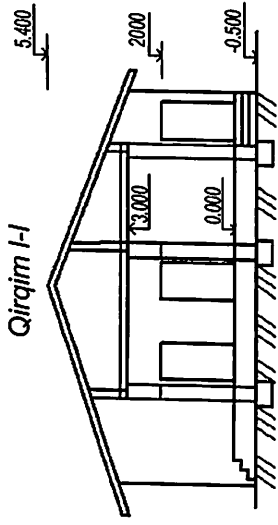
1-qavat plani



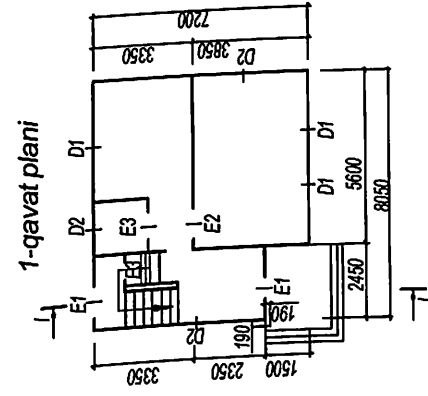
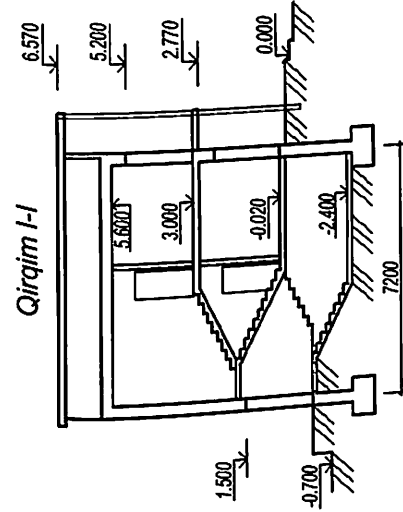
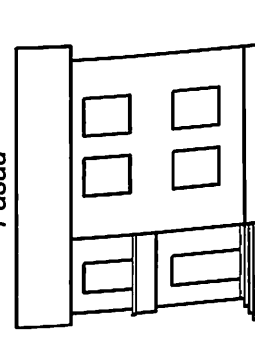
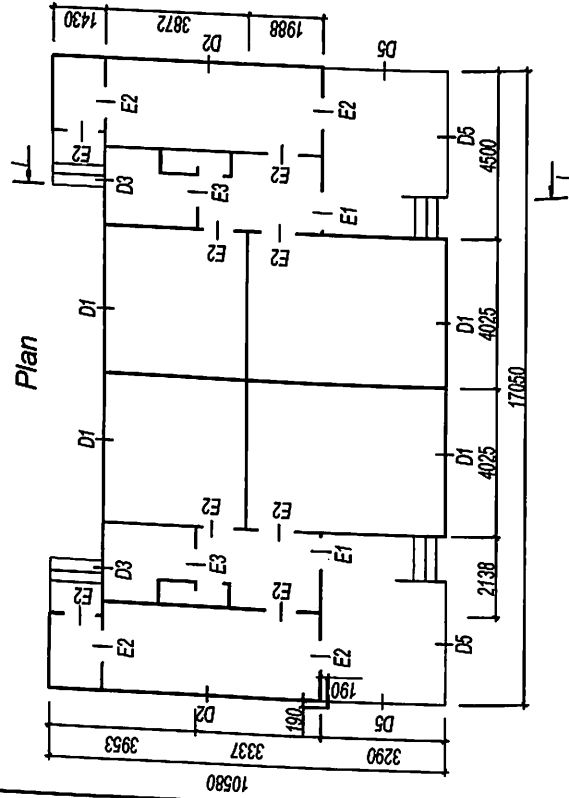
2-qavat plani



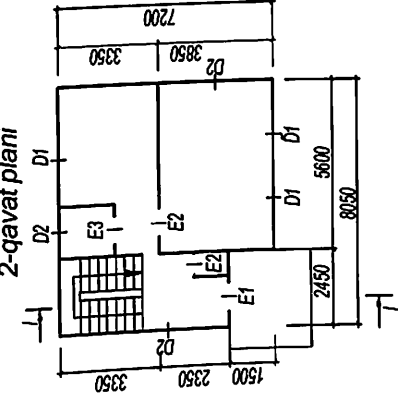
| E1          | E2          | E3         | E4         | D1          | D2          | D3          | D4         |
|-------------|-------------|------------|------------|-------------|-------------|-------------|------------|
| 2000 X 1200 | 2000 X 1100 | 2000 X 900 | 2000 X 800 | 1460 X 1470 | 1460 X 1320 | 1460 X 1175 | 1460 X 875 |



|                |                |                |               |                |  |
|----------------|----------------|----------------|---------------|----------------|--|
|                |                |                |               |                |  |
| E1             | E2             | E3             | E4            |                |  |
| 2000 X<br>1200 | 2000 X<br>1100 | 2000 X<br>900  | 2000 X<br>800 |                |  |
| D1             | D2             | D3             | D4            | D5             |  |
| 1460 X<br>1470 | 1460 X<br>1320 | 1460 X<br>1175 | 1460 X<br>875 | 1660 X<br>3200 |  |



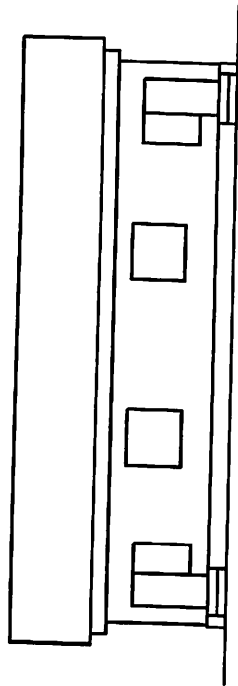
**1-qavat plani**



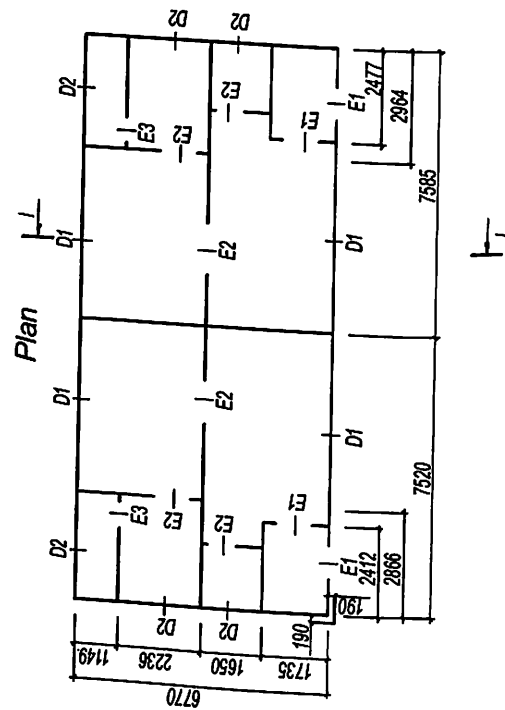
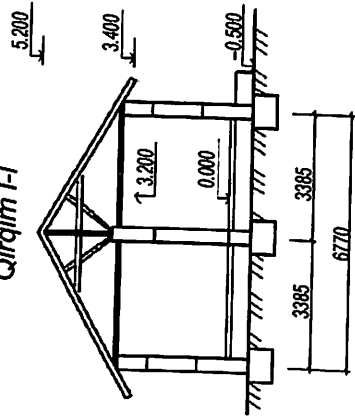
2-qavat plani

|    |                |
|----|----------------|
| E1 | 2000 X<br>1200 |
| E2 | 2000 X<br>1100 |
| E3 | 2000 X<br>900  |
| E4 | 2000 X<br>800  |
| D1 | 1460 X<br>1470 |
| D2 | 1460 X<br>1320 |
| D3 | 1460 X<br>1175 |
| D4 | 1460 X<br>875  |

Fasad



Qirgim I-I

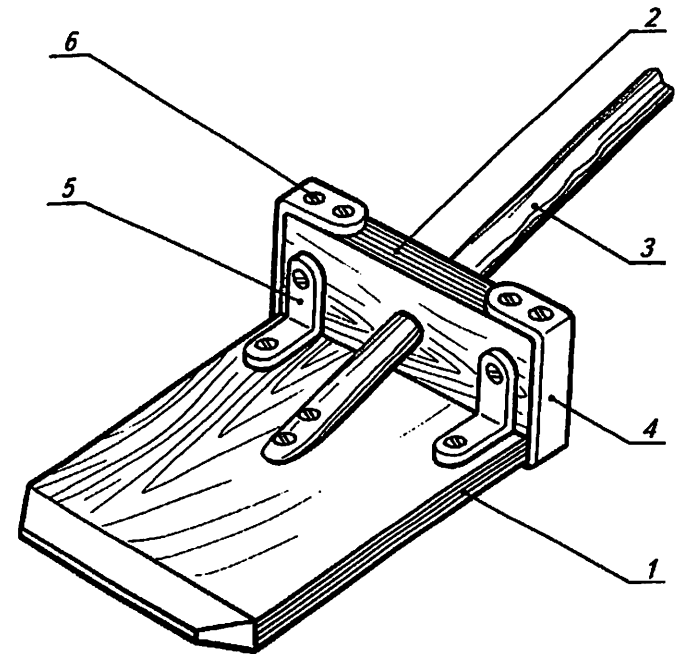
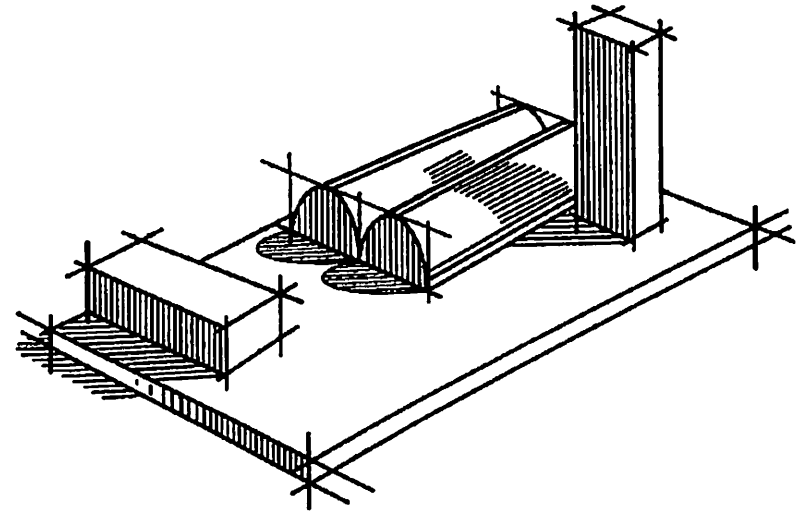


|             |             |             |            |
|-------------|-------------|-------------|------------|
| E1          | E2          | E3          | E4         |
| 2000 X 1200 | 2000 X 1100 | 2000 X 900  | 2000 X 800 |
| D1          | D2          | D3          | D4         |
| 1460 X 1475 | 1460 X 1320 | 1460 X 1175 | 1460 X 875 |

## VII QISM. MODELLASHTIRISH, KONSTRUKSIYALASH VA IJODIY YO'NALISHDAGI TOPSHIRIQLAR

Qirgim AAB 7C

Qirgim AAB 7C



Ushbu bo'limdagi topshiriqlarning bir qismi mahsulotlarning alohida detallarini konstruksiyalash va takomillashtirish bo'yicha tuzilgan bo'lib, u o'quvchilarni birmuncha murakkabroq ijodiy topshiriqlarni bajarishga tayyorlashga xizmat qiladi.

Topshiriqda o'quvchilar mahsulot tarkibiga kiruvchi detalning chizmasini bajarishlari zarur bo'ladi. Bunda ularga detalni ergonomik talablarni hisobga olgan holda takomillashtirish taklif qilinadi. Topshiriqni bajarishga kirishishdan avval o'quvchilarga detalning takomillashtirilgan yoki yangi konstruksiyasi o'rganilgan tasvir va shartliliklarni o'z ichiga olishi zarurligi tushuntiriladi (kesimlar, qirgimlar, materiallarning kesimdagi shartli belgilanishi va h.k.).

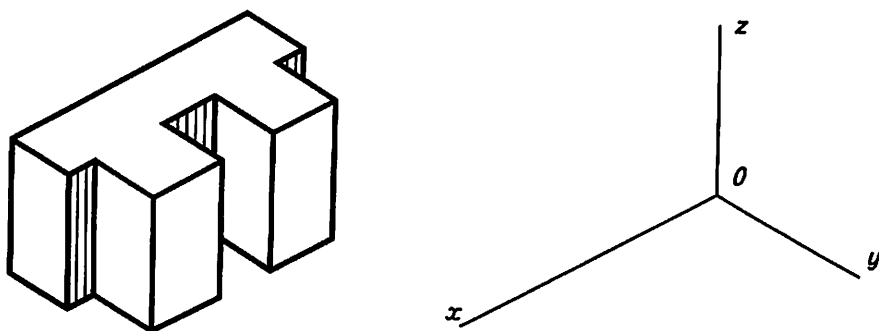
Bu bo'limdagi topshiriqlar o'quvchilarning ijodkorlik qobiliyatlarini rivojlantirish, fazoviy tasavvurlarini faollashtirish hamda keyingi mustaqil hayotda ishlab chiqarishdagi amaliy faoliyatga tayyorlashni o'z oldiga maqsad qilib qo'ygan. Ushbu topshiriqlardan chizmachilik fani o'qituvchilari bilan bir qatorda, grafik faoliyat bilan bog'liq boshqa yo'nalish, masalan, o'quv ustaxonalaridagi mashg'ulotlar fani o'qituvchilari ham foydalanishlari mumkin.

Topshiriqlarning bir qismini chizmachilik mashg'ulotlarida butun guruh bilan birgalikda bajarish mumkin. Ammo asosiy ko'pchilik topshiriqlar chizmachilikdan to'garak va fakultativ mashg'ulotlarda bajarishga, shuningdek, fan olimpiadalari uchun variantlar tayyorlashda foydalanish uchun mo'ljallangan.

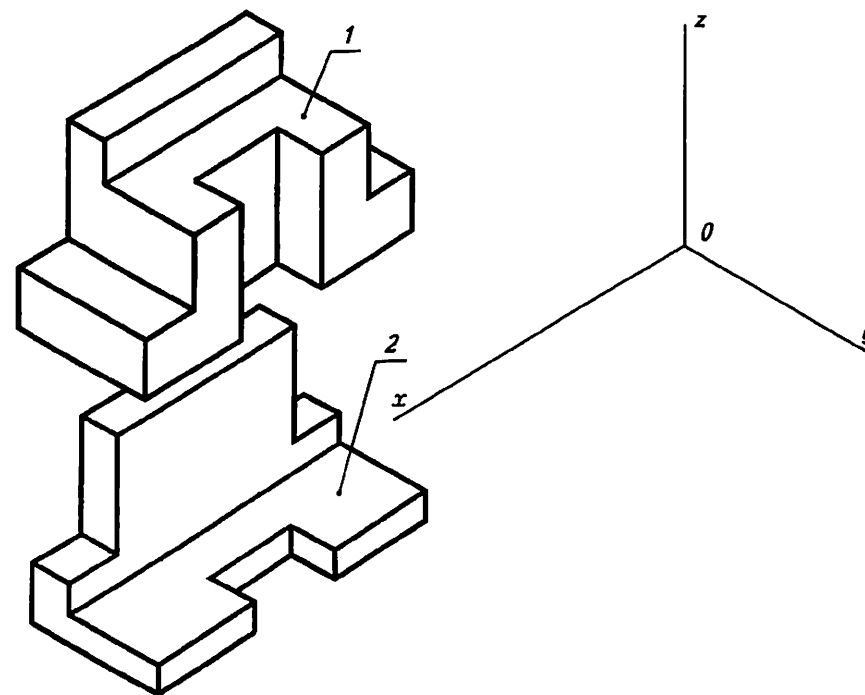
### Topshiriqlar

1. Detalning shtrixlangan tomonini gorizontal tekislikka parallel joylashadigan qilib xayolan buring.

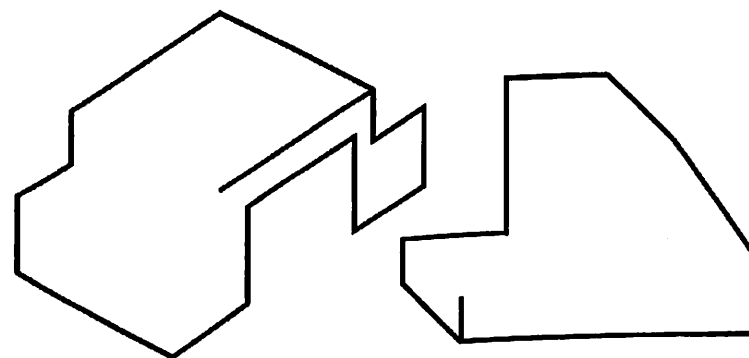
Detalning yangi vaziyatdagi izometrik proyeksiyasini quring.



2. 1-detalning bir qismi olib tashlangandan keyin 2-detal hosil bo'lgan. Olib tashlangan qismning izometrik proyeksiyasini quring.



3. Yetishmaydigan chiziqlarni quring.

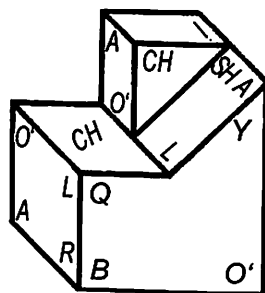
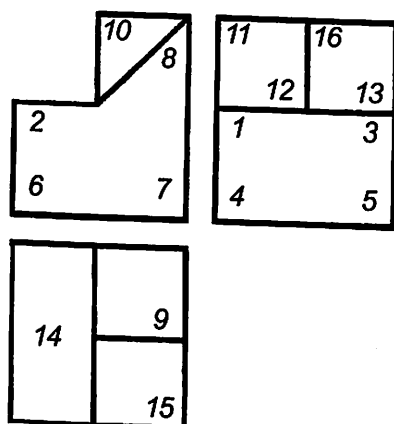


4. Shaklda detalning uchta proyeksiyasi va aksonometrik tasviri berilgan. To'g'ri burchakli proyeksiyalardan raqamlarni tartib bo'yicha olib, ularni aksonometrik tasvirdagi mos elementlardagi harflar bilan almashtirib, «aksonometriya» so'zining grekchadan tarjimai qanday bo'lishini aniqlang.

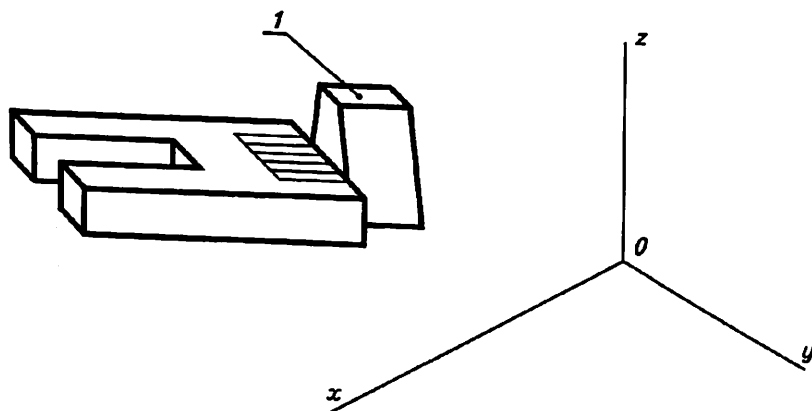
Aksonometriya (grek.) —

|   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
|   |   |   |   |   |   |   |   |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

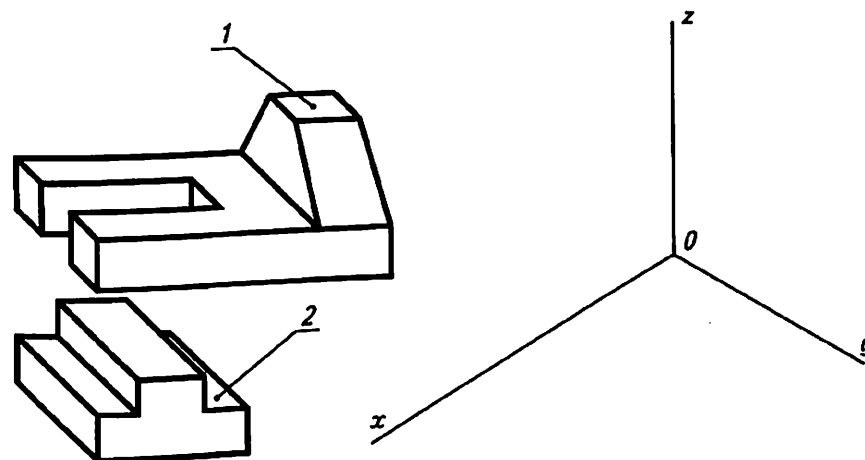
|   |    |    |    |    |    |    |    |
|---|----|----|----|----|----|----|----|
|   |    |    |    |    |    |    |    |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |



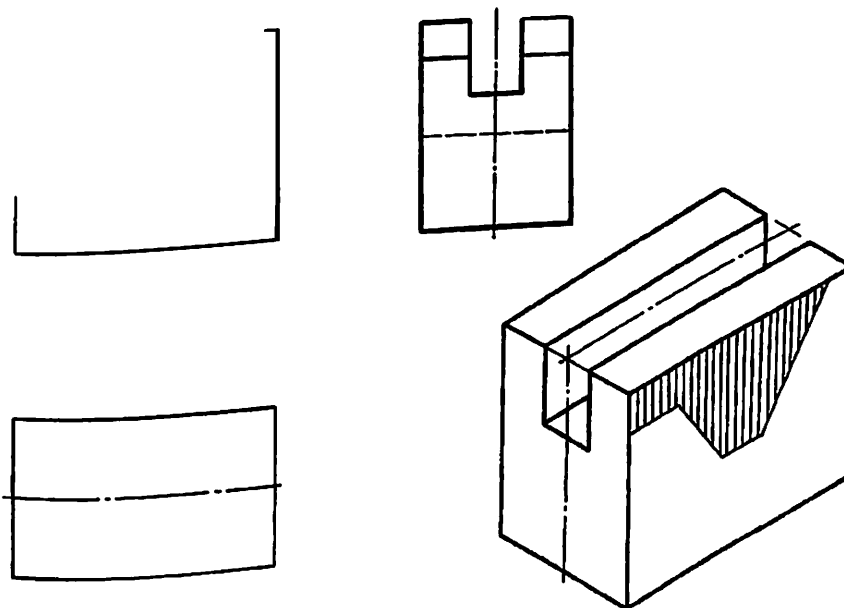
5. 1-elementni shtrixlangan joyga ko'chirib o'rnat. Yangi detalning izometrik proyeksiyasini quring.



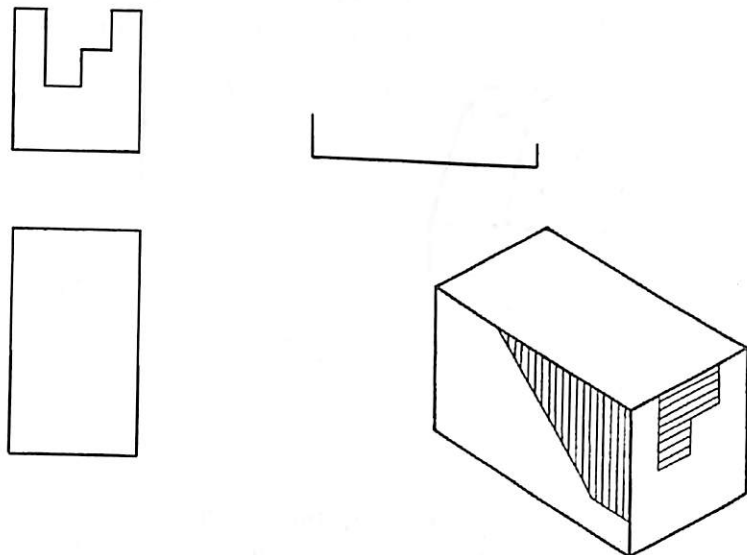
6. 1-elementning o'rniga 2-elementni o'rnat. Hosil bo'lgan detalning izometrik proyeksiyasini quring.



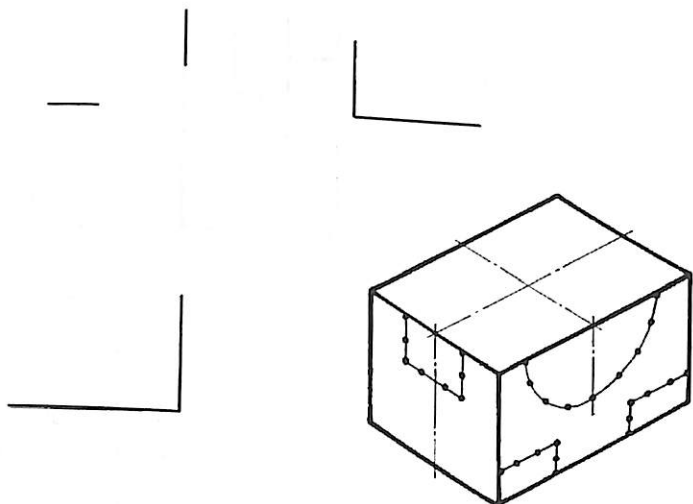
7. Shtrixlangan qismni buyumning hamma qismidan to'la-ligicha olib tashlang. Hosil bo'lgan detalning yetishmaydigan ko'rinishlarini quring.



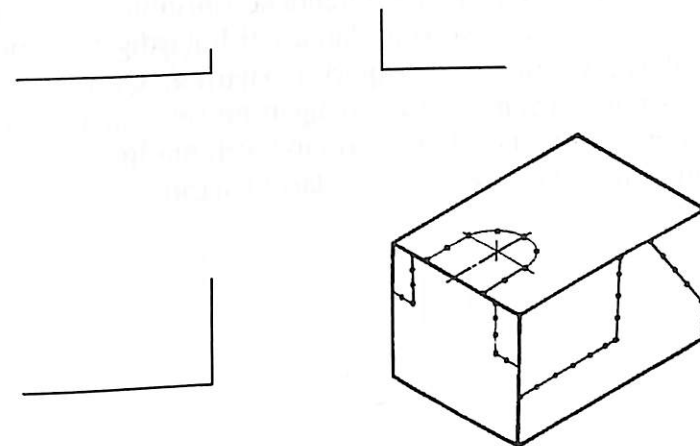
8. Shtrixlangan qismni buyumning hamma qismidan to'raligicha olib tashlang. Hosil bo'lgan detalning uchta ko'rinishini bajarib, o'lchamlarini qo'ying.



9. Rejalashtirish chizig'i bilan belgilangan qismlarni buyumning hamma qismidan to'raligicha olib tashlang. Hosil bo'lgan detalning uchta ko'rinishini bajarib, o'lchamlarini qo'ying.

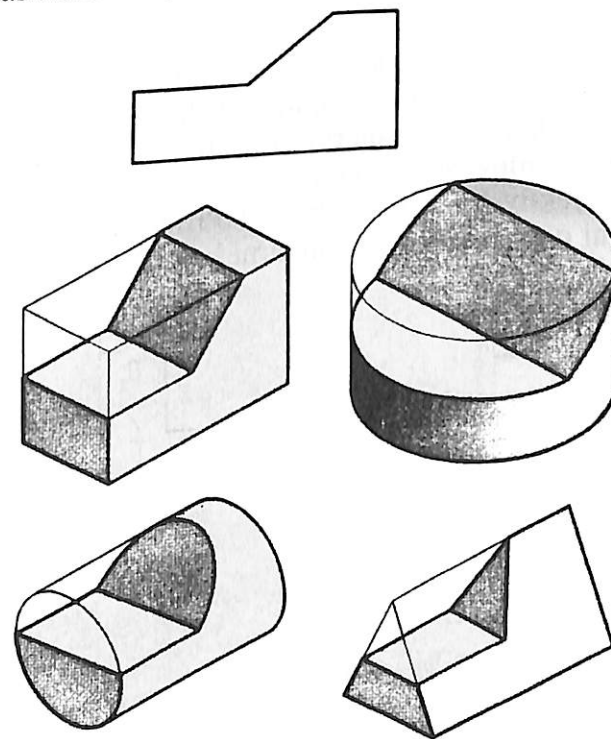


10. Rejalashtirish chizig'i bilan belgilangan qismlarni buyumning hamma qismidan to'raligicha olib tashlang. Hosil bo'lgan detalning uchta ko'rinishini bajarib, o'lchamlarini qo'ying.



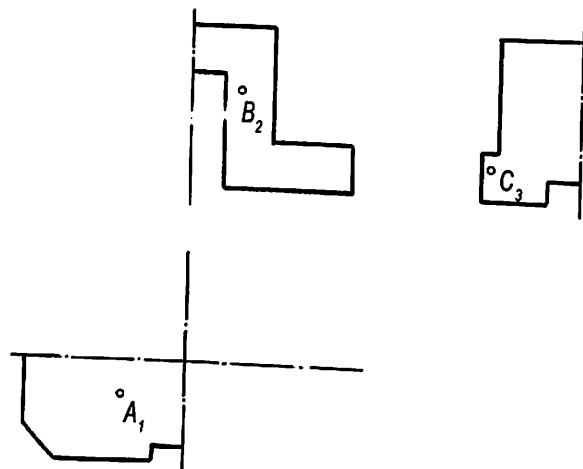
11. Ushbu to'rtta jism bir-biriga o'xshamaydi, lekin ular umumiy ortogonal proyeksiyaga ega. Bunga o'xshash jismlardan yana ko'plab misollarni keltirish mumkin.

Tasvirlangan ortogonal proyeksiyaga mos keladigan jismlarning texnik rasmlarini bajaring.

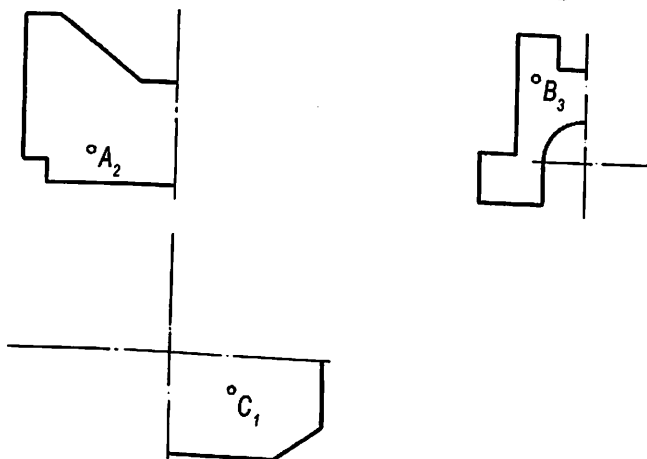




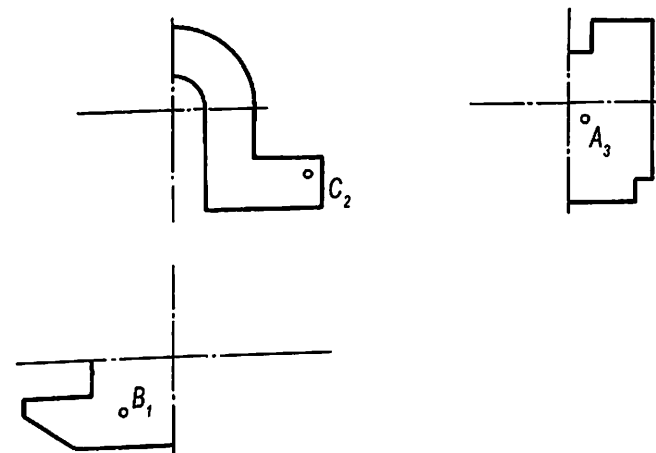
**12.** Simmetrik detal (qopqoq) uchta ko'rinishining har biridan faqat bir qismi berilgan. Ko'rinishlarda yetishmaydigan chiziqlarni chizib, ularning kontur chiziqlarini bajaring. Qopqoq sirtida joylashgan nuqtalarning yetishmaydigan proyeksiyalarini quring. Nuqtalar proyeksiyalarining ko'rinar-ko'rinmasligini aniqlang. O'lchamlarini qo'ying. Zarur kesimlarni bajaring.



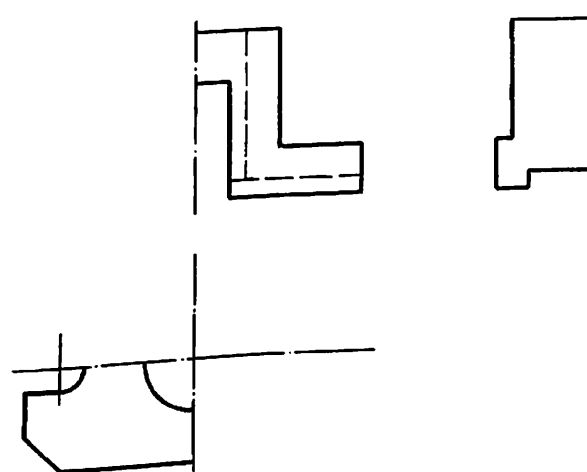
**13.** Simmetrik detal (qopqoq) uchta ko'rinishining har biridan faqat bir qismi berilgan. Ko'rinishlarda yetishmaydigan chiziqlarni chizib, ularning kontur chiziqlarini bajaring. Qopqoq sirtida joylashgan nuqtalarning yetishmaydigan proyeksiyalarini quring. Nuqtalar proyeksiyalarining ko'rinar-ko'rinmasligini aniqlang. O'lchamlarini qo'ying. Zarur kesimlarni bajaring.



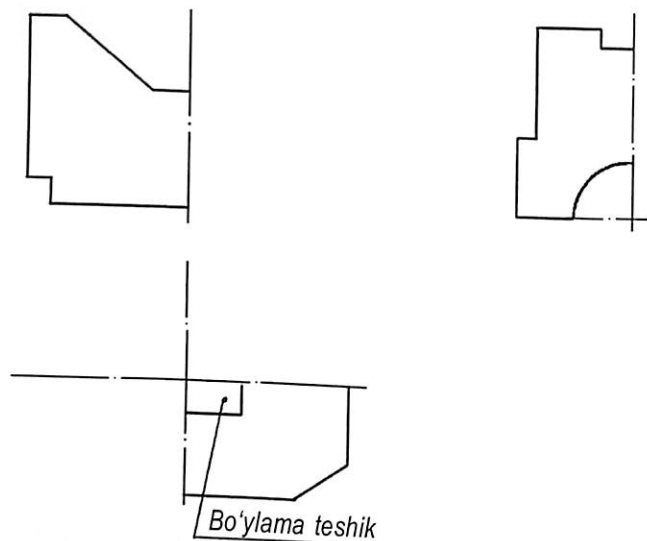
**14.** Simmetrik detal (qopqoq) uchta ko'rinishining har biridan faqat bir qismi berilgan. Ko'rinishlarda yetishmaydigan chiziqlarni chizib, ularning kontur chiziqlarini bajaring. Qopqoq sirtida joylashgan nuqtalarning yetishmaydigan proyeksiyalarini quring. Nuqtalar proyeksiyalarining ko'rinar-ko'rinmasligini aniqlang. O'lchamlarini qo'ying. Zarur kesimlarni bajaring.



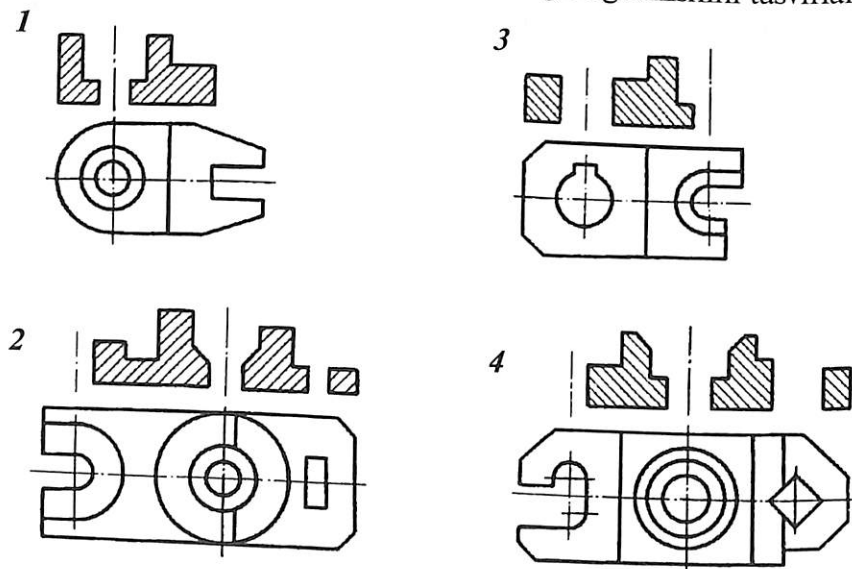
**15.** Qopqoqning olddan ko'rinishining tugallanmagan yarmi, ustidan ko'rinish shaklining choragi va chapdan ko'rinish shaklining yarmi berilgan. Detal tasvirining yetishmaydigan qismlarini quring, yetishmaydigan zarur chiziqlarni tiklang, kerakli joylarda ko'rinishning bir qismi bilan qirqimning bir qismini birlashtirib, foydali qirqimlarni bajaring. Qopqoq ikkita simmetriya tekisligiga ega. O'lchamlarini qo'ying.



16. Qolipning olddan ko'rinish shaklining yarmi, ustdan ko'rinish shaklining choragi va chapdan ko'rinish shaklining yarmi berilgan. Detalning yetishmaydigan qismlarining shaklini qurib yakunlang, yetishmaydigan zarur chiziqlarni tiklang, zarur joylarida ko'rinish bilan birgalikda foydali qirqimlarini bajaring. Qopqoq ikkita simmetriya tekisligiga ega. O'lchamlarini qo'ying.



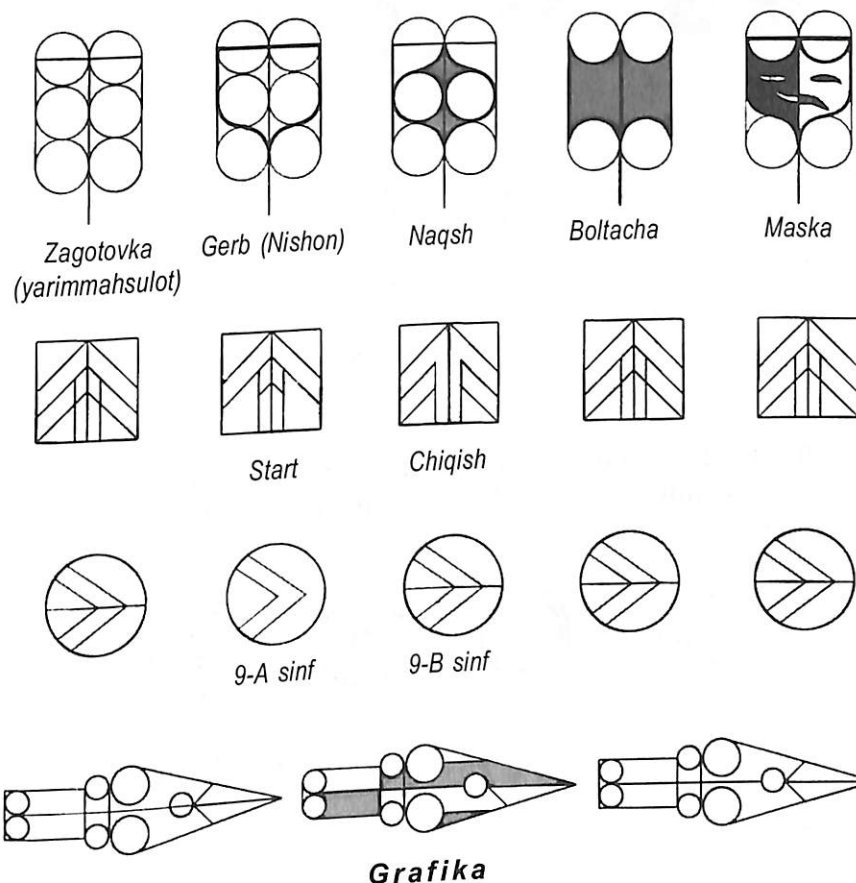
17. Ustdan ko'rinish va kesim bo'yicha frontal qirqimni yakunlang. Zarur bo'lgan o'rinlarda qirqimlarning belgilanishini tasvirlang.



18. Berilgan grafik ishlanmaning ustidan turli qalinlikdagi chizma chiziqlari bilan yurgizib chiqib, grafik obraz-belgi: logotip, ramz, tovar belgisi va h.k. loyihalashda yordamchi vosita sifatida konturni rang bilan bo'yash yoki obrazlarning kichik shakllarini tushirishdan foydalanish mumkin. Hosil bo'lgan obrazni nomlang.

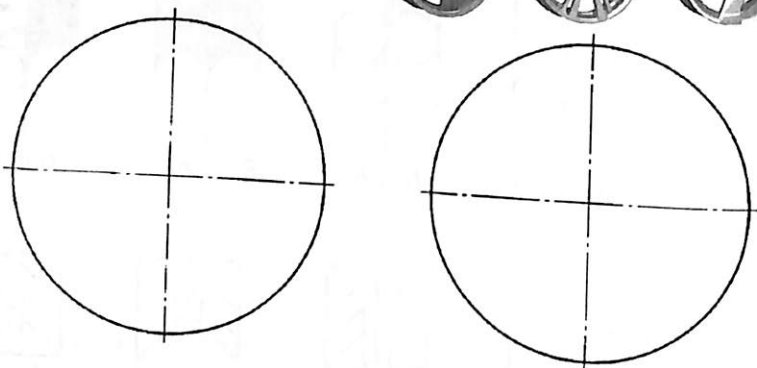
Fantaziyangizni sinab ko'ring — u qanchalik boy bo'lsa, shuncha ko'p obraz variantini yaratasiz.

Ishga kirishishdan oldin misollarni tahlil qilib, o'rganishni tavsiya qilamiz.

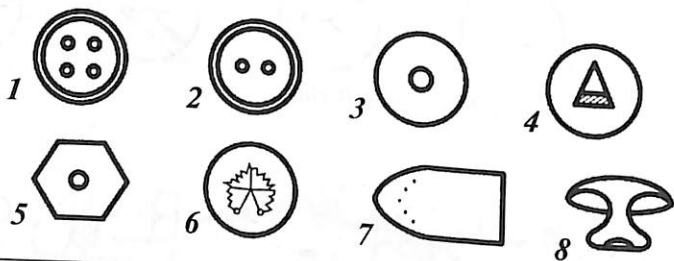


19. Avtomobil g'ildiragi pokrishka, kamera va diskdan tashkil topgan. Har bir avtomobil kompaniyasi disklarning original dizaynini o'ylab topib, tayyorlangan disklar bilan avtomobillarni yanada chiroyli ko'rinishini ta'minlashga harakat qiladi. Tasvirda keltirilgan disklardan birini tanlab olib, uning chizmasini bajaring.

Agar bu mavzu sizni qiziqtirib qolgan bo'lsa, bir necha disklar eskizini ishlab, mualliflik variantingiz loyihasini bajaring.

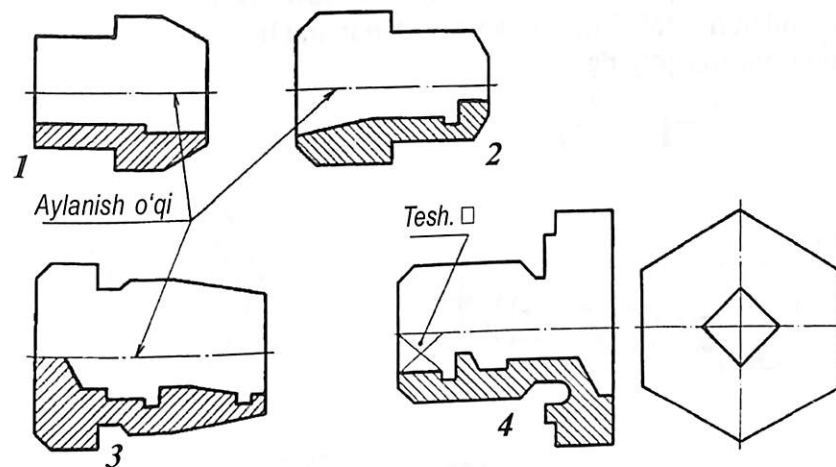


20. Shaklda qanday buyumlar tasvirlanganini jadvalga yozing. O'zingiz biladigan boshqa buyumlarni o'ylab, ularning tasvirini bajaring va nomini jadvalga yozing.

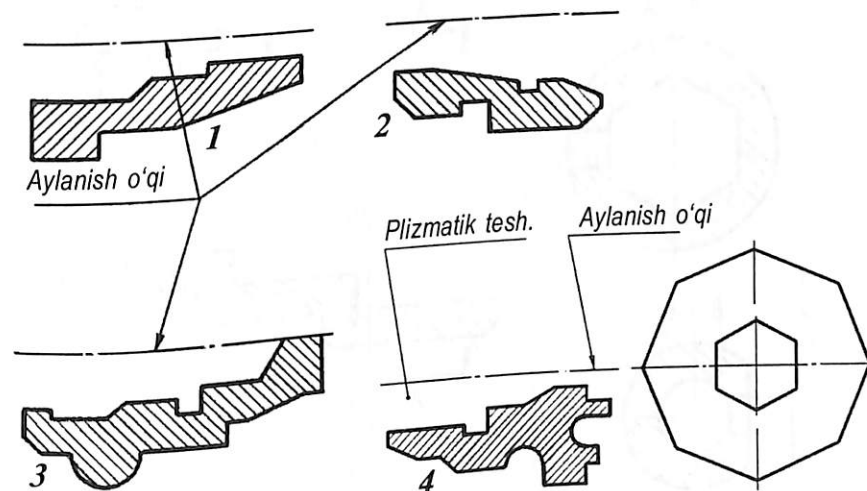


|   |  |   |  |    |  |
|---|--|---|--|----|--|
| 1 |  | 5 |  | 9  |  |
| 2 |  | 6 |  | 10 |  |
| 3 |  | 7 |  | 11 |  |
| 4 |  | 8 |  | 12 |  |

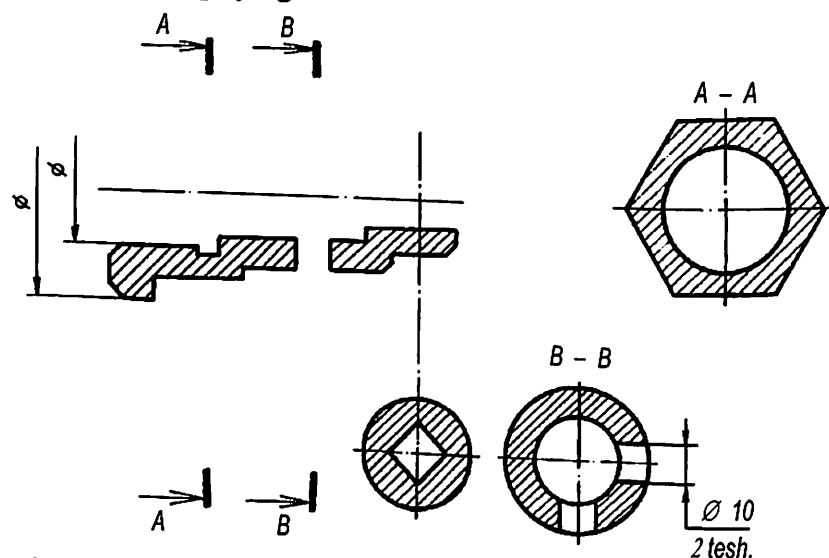
21. 1–3-detallarning aylanish o'qi va 4-detaling 2 ta proyeksiyasi tasvirlaridan foydalanib frontal qirqimni yakunlang.



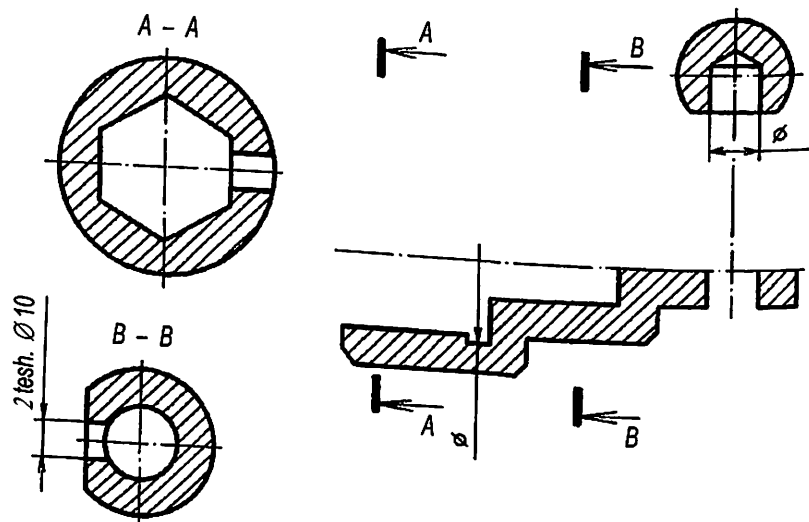
22. 1–4-shaklda berilgan kesimlarning aylanish o'qi atrofida harakatidan hosil bo'ladigan detal shaklini tasvirlang. 4-vazifada 2 ta istisno mavjud: chapdan ariqchagacha bo'lgan teshik oltiburchakli to'g'ri prizma shaklida bajarilgan; o'ngda – kallak sakkiz burchakli prizma ko'rinishida. Detallarning asosiy tasvirini asosiy ko'rinishning yarmi bilan frontal qirqimning yarmini birlashtirib tasvirlang. Bunda 4-vazifada kichik qismda simmetriya o'qi bilan asosiy tutash chiziq – kallak tashqi tomonlarining kesishish chizig'i ustma-ust tushadi.



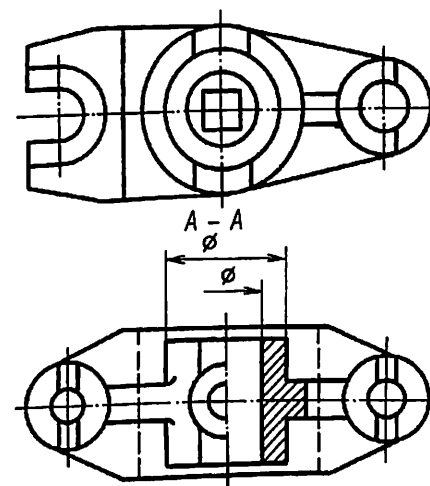
23. Detal qirqimi tarkibiga kiruvchi kesim va chiqarilgan kesimlar berilgan. Qo'yilgan o'lcham va belgilarni hisobga olib detalning asosiy tasvirini quring. Ushbu holda asosiy tasvir bosh ko'rinishning yarmi bilan frontal qirqimning yarmidan iborat bo'lishi mumkinmi? O'lchamlarini qo'ying.



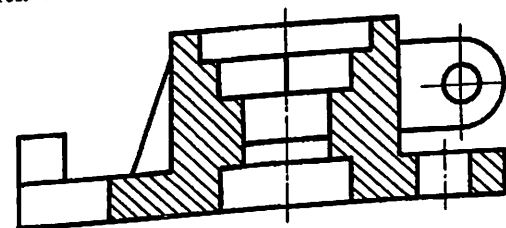
24. Detal qirqimi tarkibiga kiruvchi kesim va chiqarilgan kesimlar berilgan. Qo'yilgan o'lcham va belgilarni hisobga olib detalning asosiy tasvirini quring. Ushbu holda asosiy tasvir bosh ko'rinishning yarmi bilan frontal qirqimning yarmidan iborat bo'lishi mumkinmi? O'lchamlarini qo'ying.



25. Detalning ustdan ko'rinishi berilgan. Ushbu detal shaklining kamida ikkita variantini xayolan tasavvur qiling va har birining asosiy tasvirini chizing.



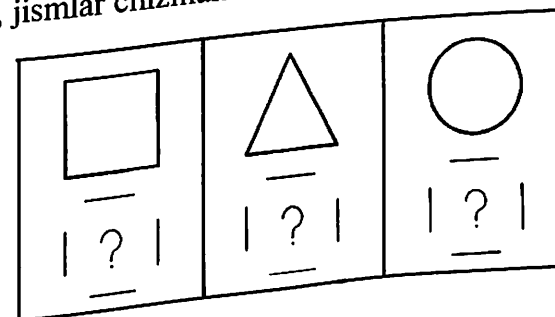
26. Berilgan frontal qirqim bo'yicha detal konstruksiyasining kamida ikkita variantining ustdan ko'rinishi chizmasini bajaring.

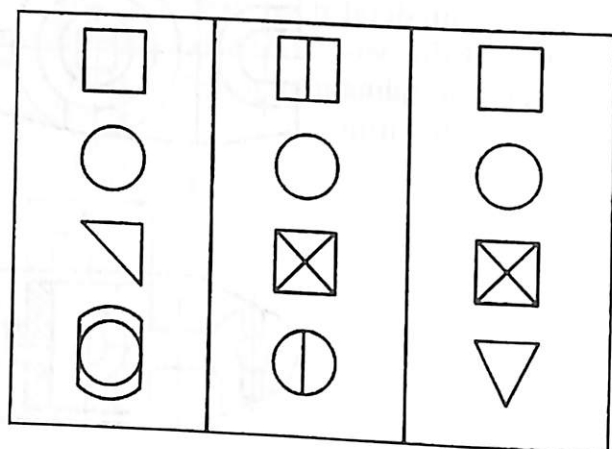


Quyida fazoviy tasavvurlarni rivojlantirishga mo'ljallangan topshiriqlar va ular yechimlarining ayrim variantlari keltirilgan. Qo'yilgan vazifa va keltirilgan yechim variantlarini tahlil qilib, vazifa yechimining yangi variantlarini toping.

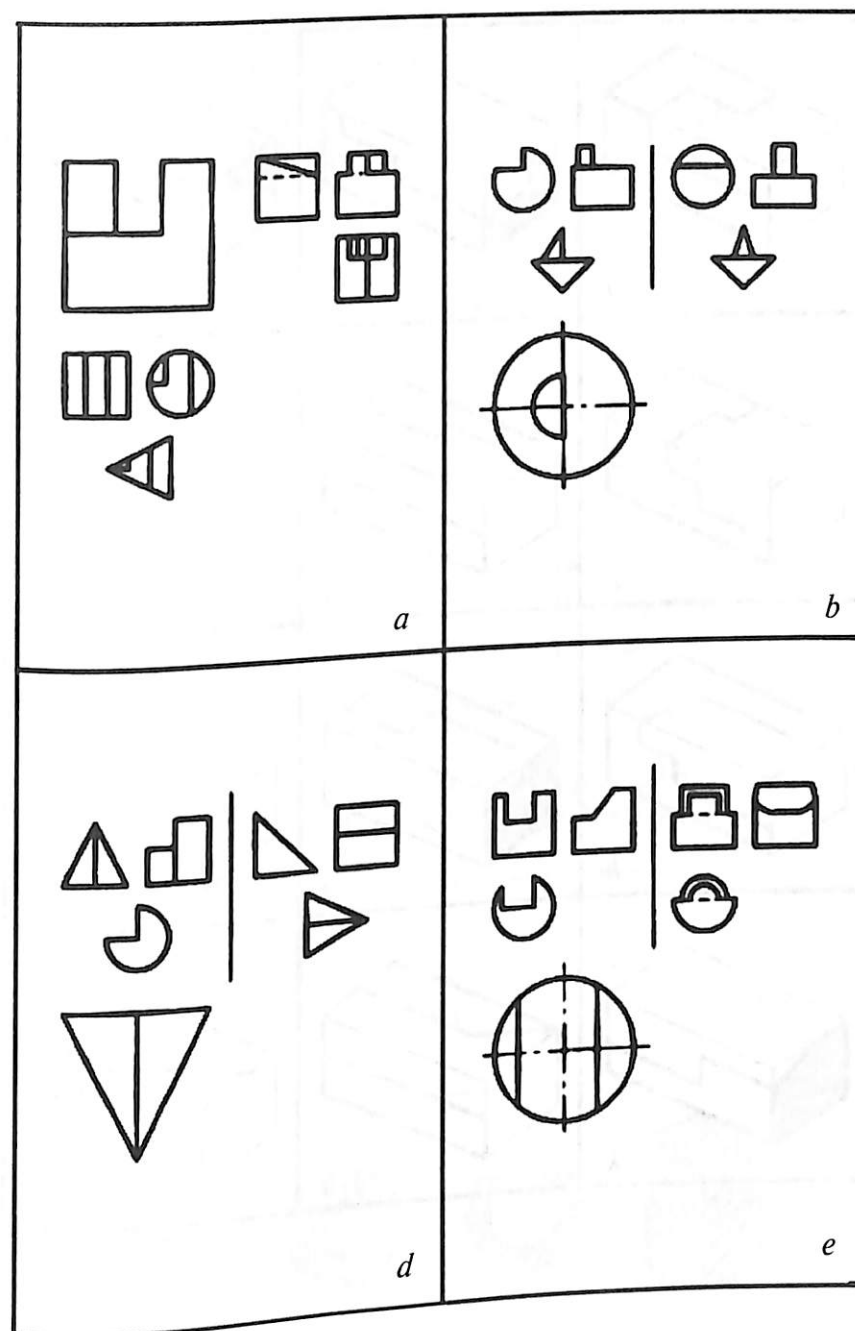
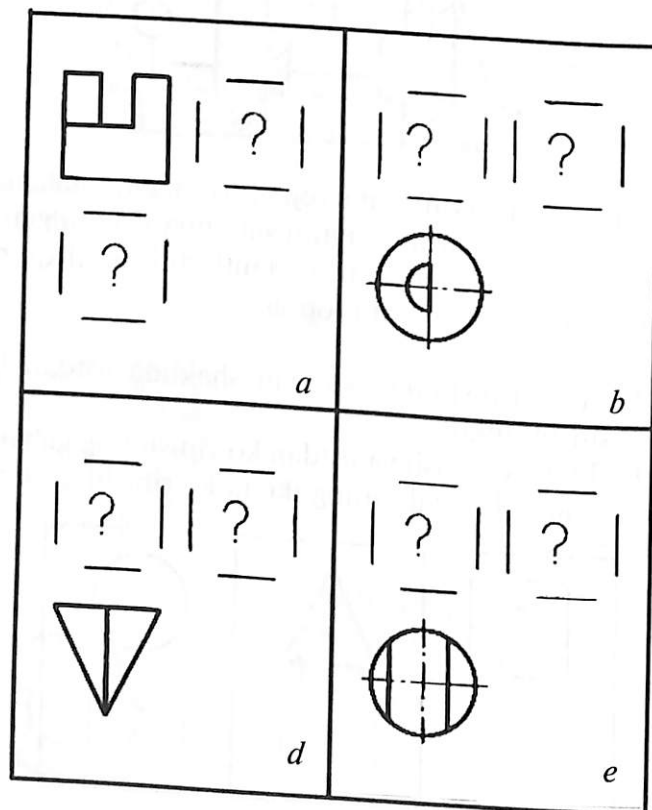
27. Olddan ko'rinishning berilgan shaklida ustdan ko'rinish qanday bo'lishi mumkin?

Vazifa. Olddan ko'rinish va ustdan ko'rinishning gabariti berilgan bo'lsa, jismlar chizmalarining ikkita ko'rinishlarini bajaring.

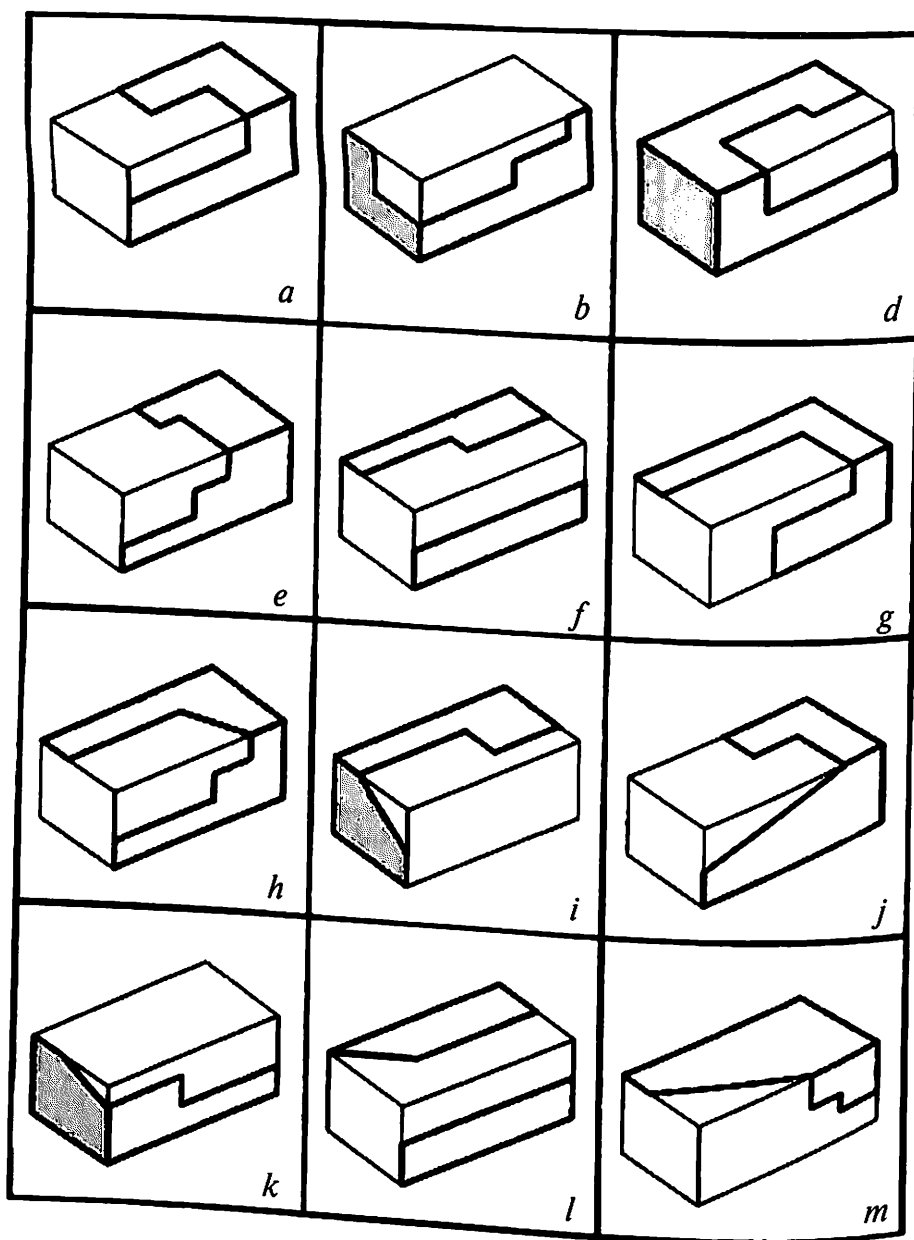




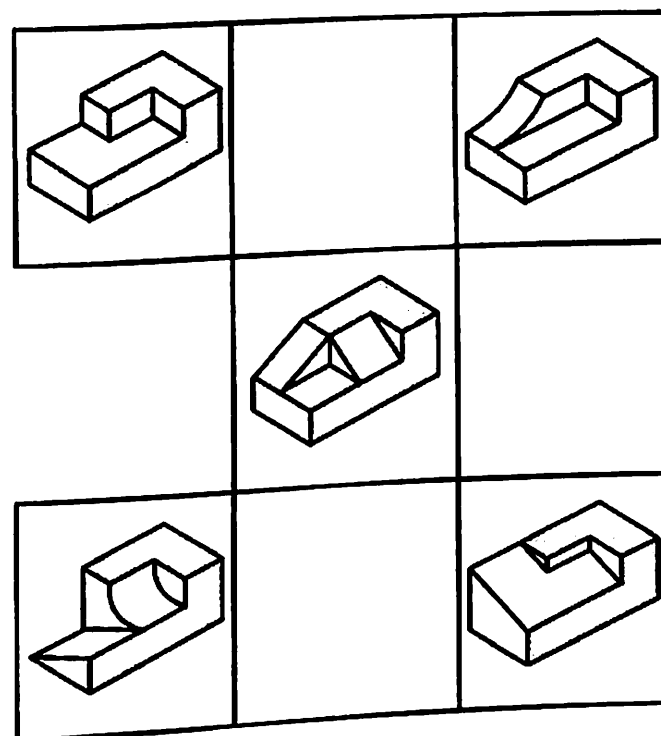
28. Jism ko'rinishlaridan biri va qolgan ikkita ko'rinishining gabaritlari ma'lum bo'lsa, jism chizmasini bajaring.  
 Eslatma. Ko'rinishning berilgan shaklini o'zgartirish mumkin emas.



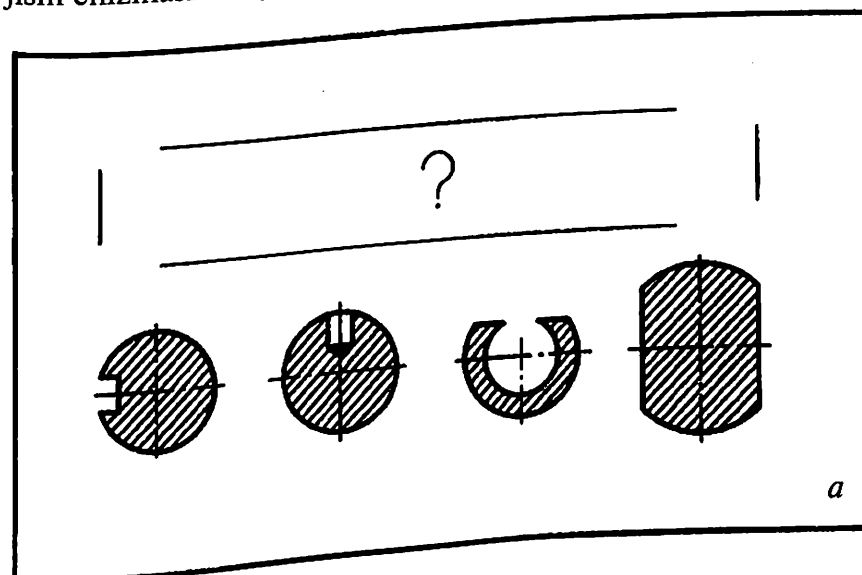
29. Jismning texnik rasmini yakunlang.

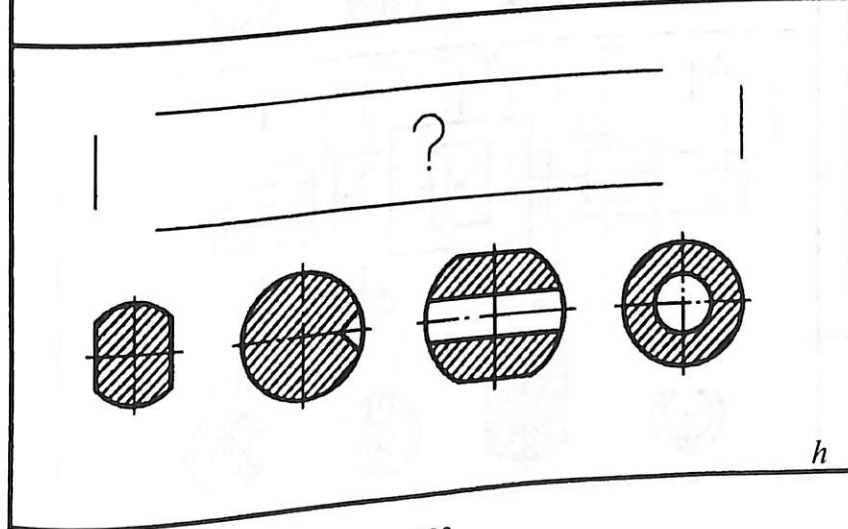
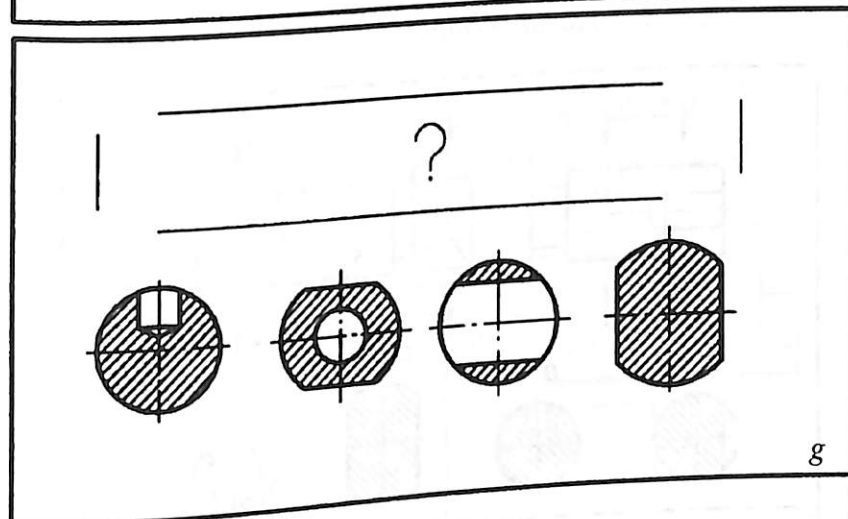
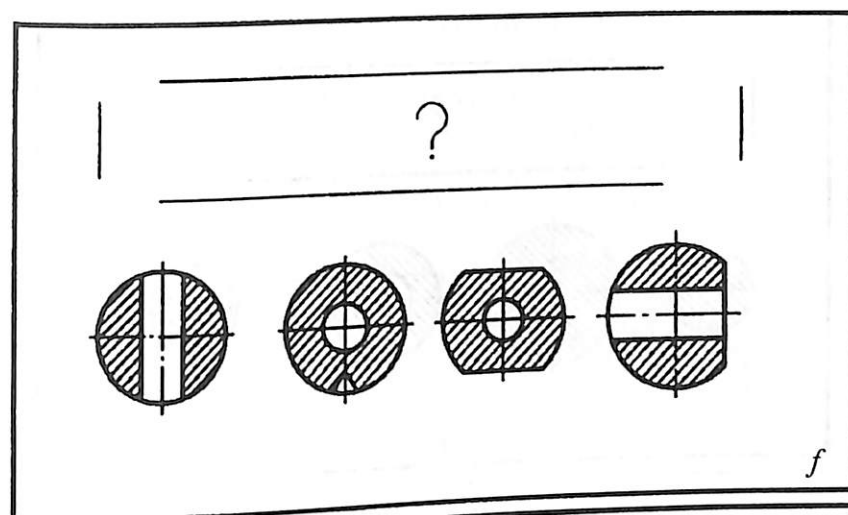
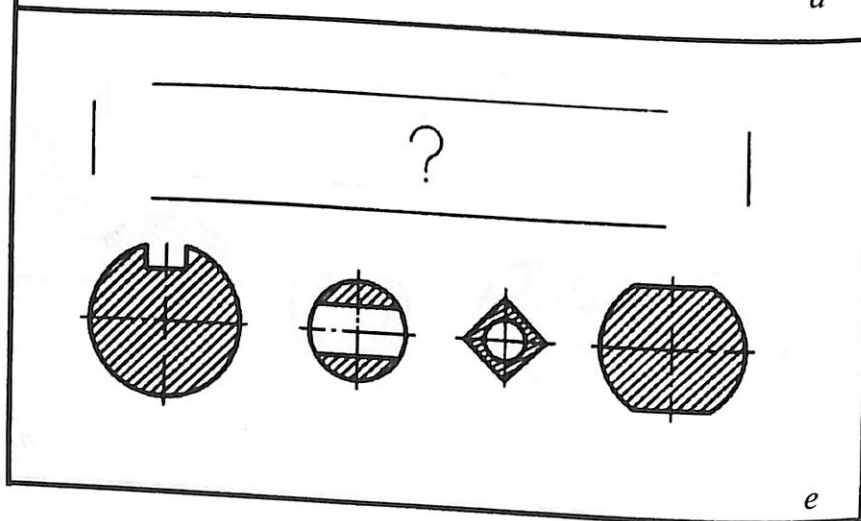
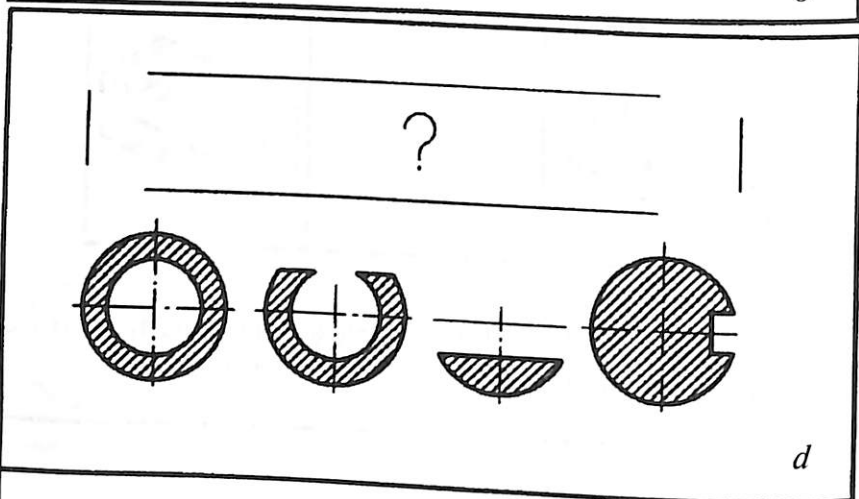
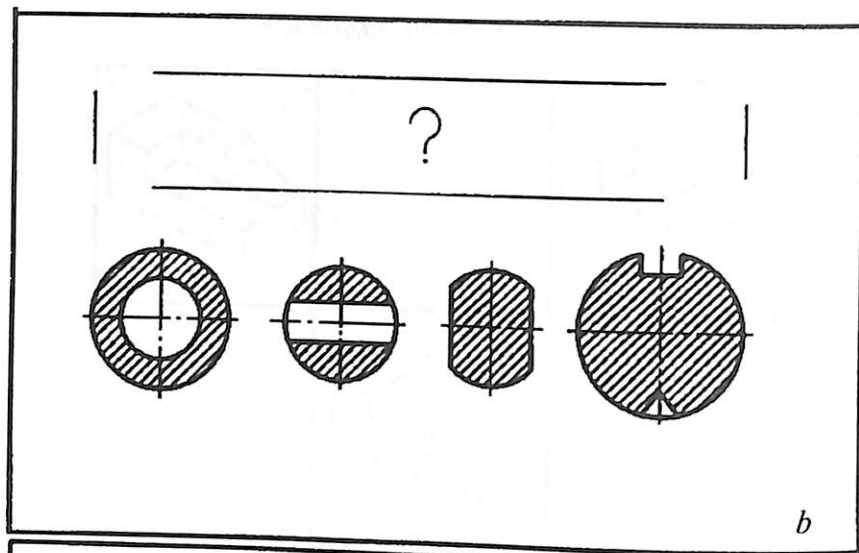


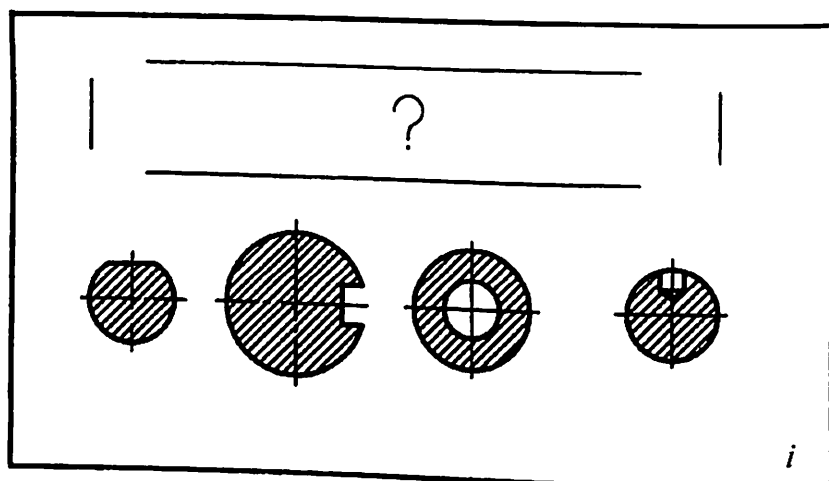
Vazifa yechimi variantlari



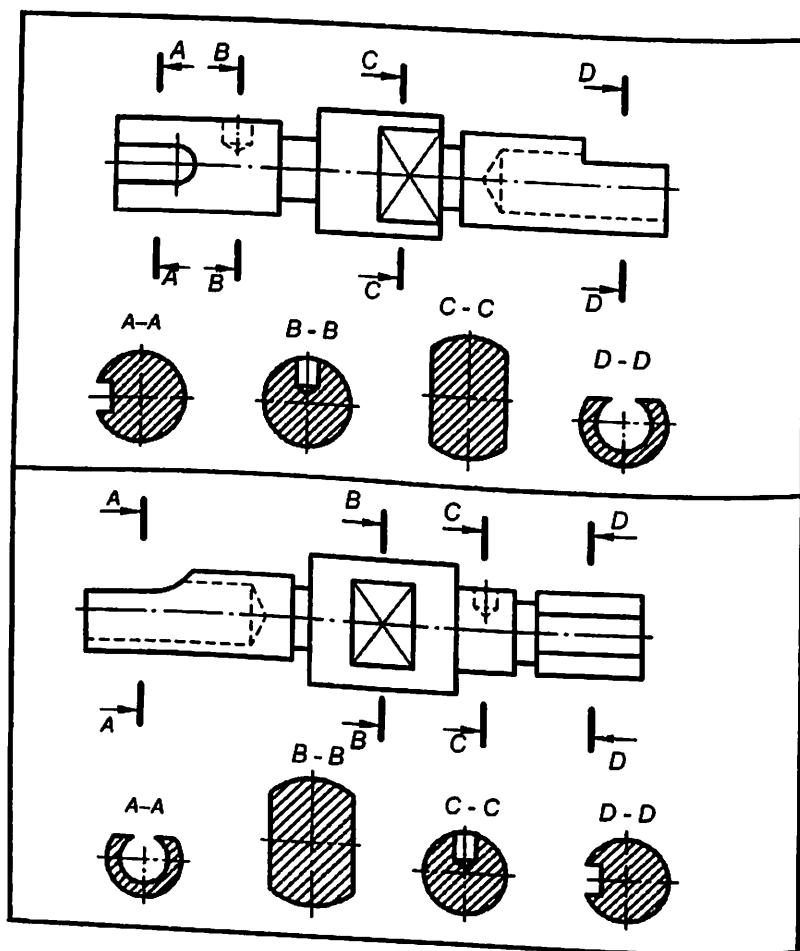
30. Berilgan kesimlar va bosh ko'rinishning gabaritlari bo'yicha jism chizmasini bajaring; kesim belgilarini tasvirlang.







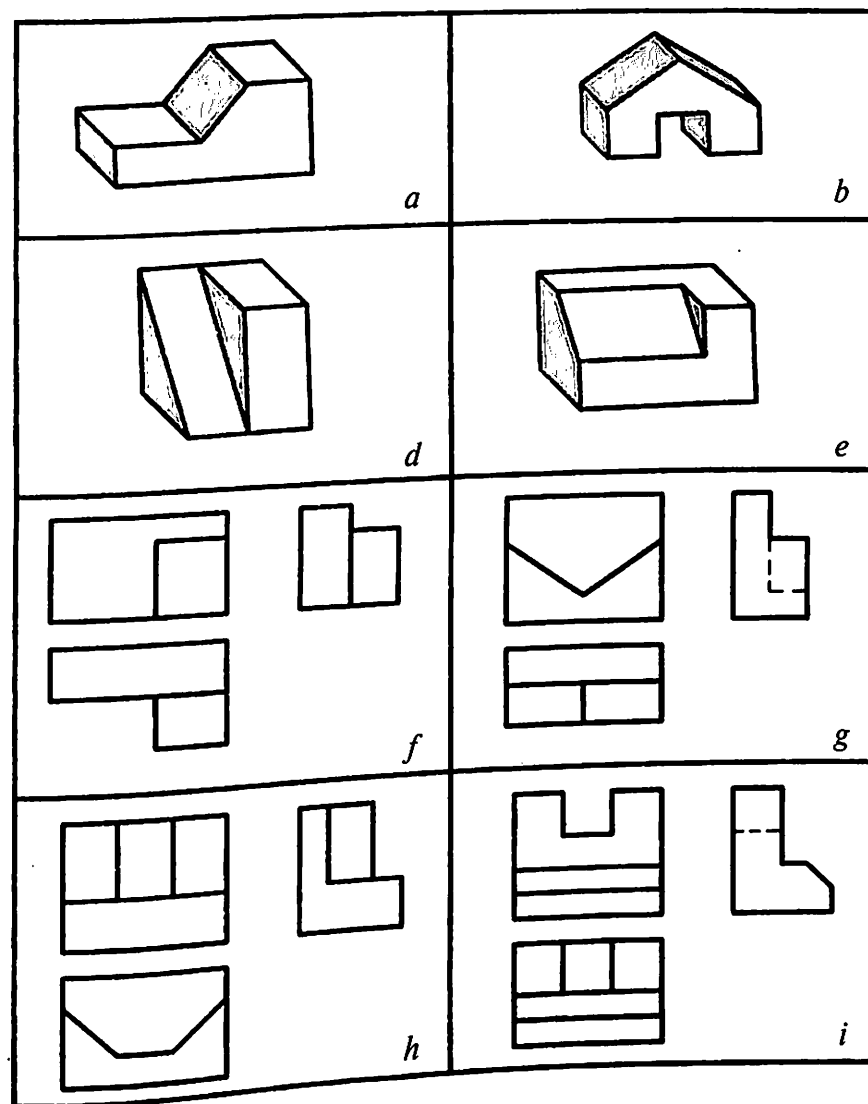
*Vazifa yechimi variantlari*



31. Yaqqol tasvir yoki obyekt chizmalari bo'yicha yoyilma bajarish.

*Vazifa.* Yelimlash uchun qopqoqlarning vaziyati va elementlarning uchrashish sxemasini tasvirlab proyeksiyalashni o'rganish uchun model yoyilmasi chizmasini bajaring.

*Eslatma.* Yoyilma yaxlit shakldan iborat bo'lishi kerak.

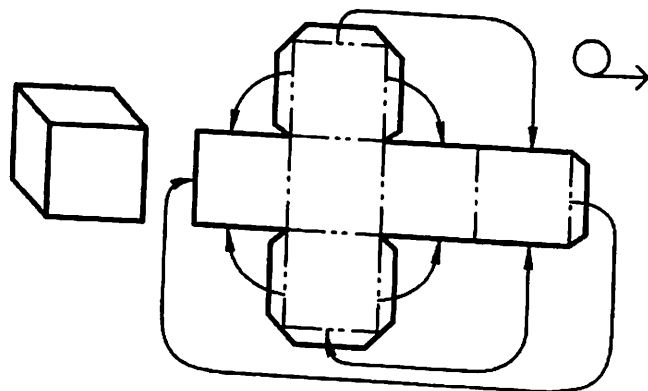




### Vazifa yechimiga 1-misol

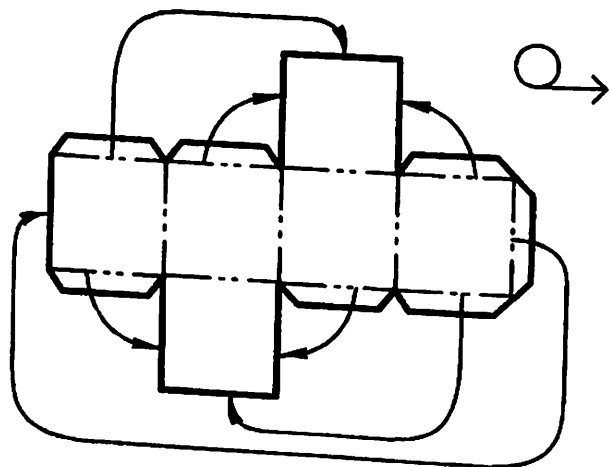
Kub yoyilmasi chizmasini bajarish.

Qog'oz yoki kartondan kub tayyorlash uchun avval uning yoyilmasini chizib olish kerak. Zarur joylariga yelim surtishga qopqoqlarni qoldirib ketish uchun yoyilmani buklaganda qanday qismlari bir-biri bilan uchrashishini tasavvur qilish kerak bo'ladi. Chizmada bu strelka bilan ko'rsatilgan.

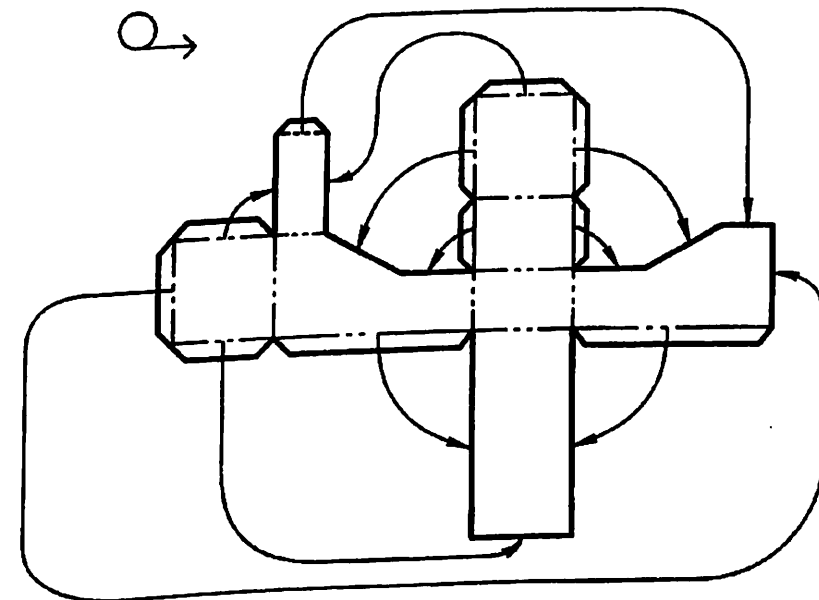
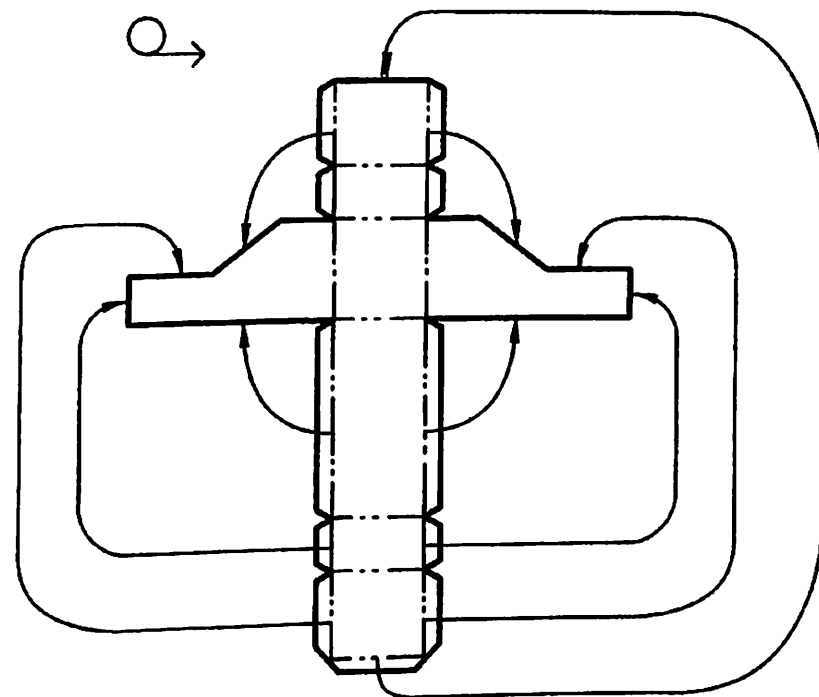


32. Kub tomonlarining vaziyatini yoyilmada o'zgartirish imkoniyatini qidirib ko'ring.

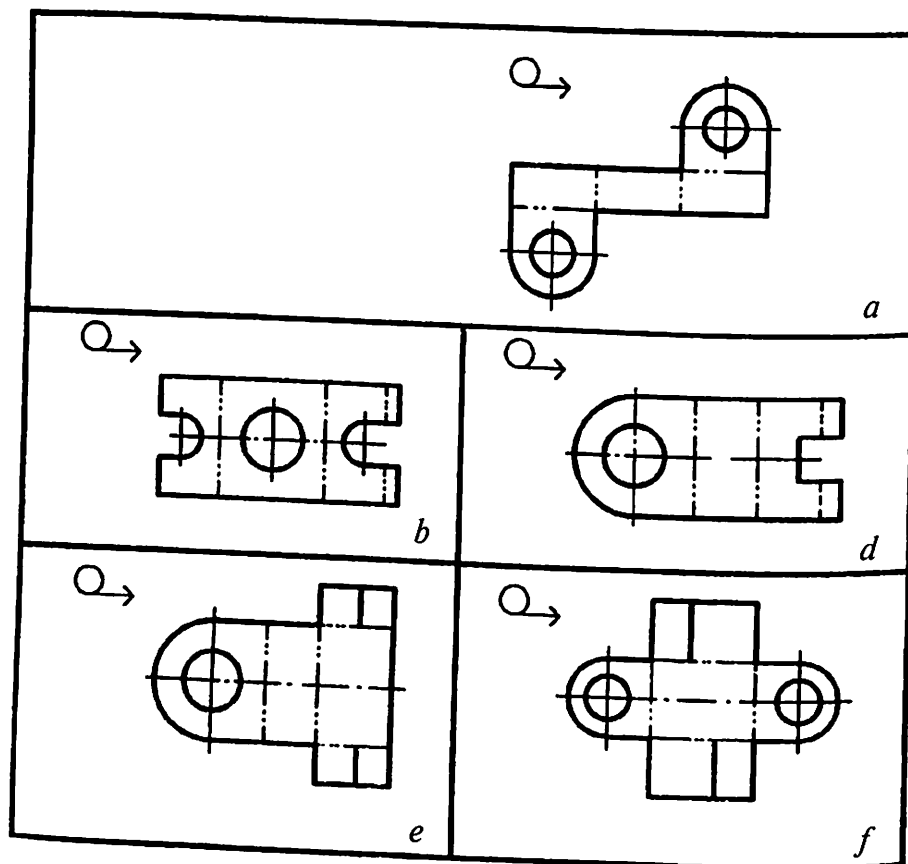
Vazifa. Tomonlari va yelimlash uchun qoldirilgan qopqoqlarining vaziyatlari o'zgartirilgan kubning yoyilmasini chizing. Kub modelini yelimlashda yoyilma elementlarining uchrashish sxemasini strelkalar bilan ko'rsating.



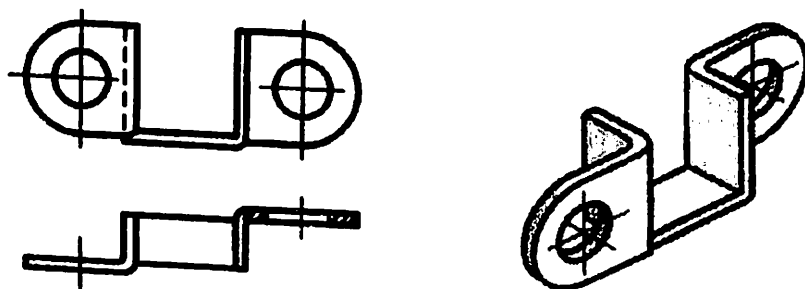
### Vazifa yechimiga 2-misol



**33. Yoyilmasi bo'yicha detal chizmasi va texnik rasmini bajarish.**  
*Vazifa.* Detalning yoyilmasi bo'yicha chizmasi va texnik rasmini bajaring. Materialning qalinligi 1 mm atrofida qabul qilinadi.



*Vazifa yechimi varianti*

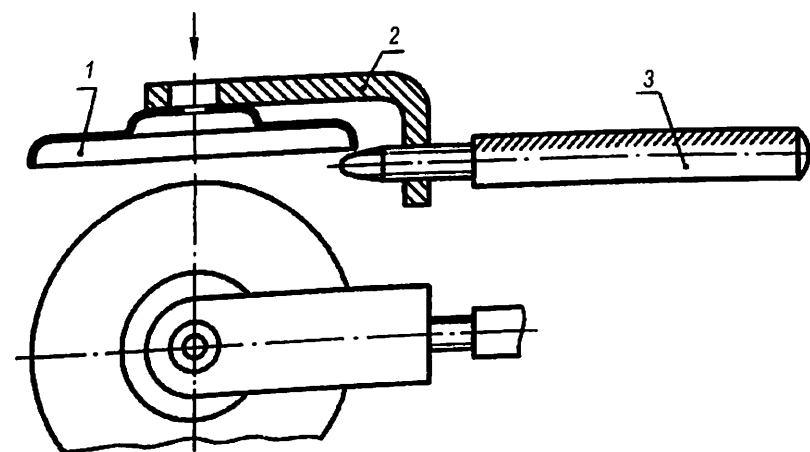


**34. Uy sharoitida konservalash moslamasi konstruksiyasini yakunlash.**

Moslama metall qopqoqlarni idishlarga qotirib mahkamlashda qo'llaniladi. Moslamani ishlatishda strelka yo'nalishi bo'yicha tayanch tutqich ustidan bosib, dasta 3 begunok 2 bilan birgalikda aylantiriladi. Bir vaqtning o'zida dasta buralib valsevatel bilan birgalikda begunokka buralib kiritib boriladi.

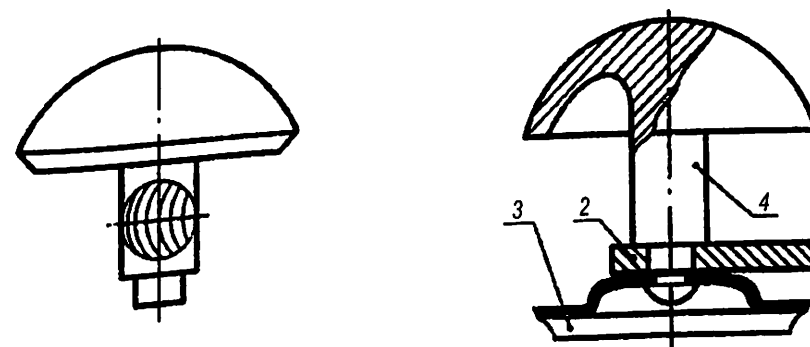
*Vazifa.* 1. Oboyma (halqa) 1 bilan qo'zg'almas qilib biriktirilgan tayanch tutqich konstruksiyasini ishlab chiqing. Begunok 2 dasta 3 bilan vertikal o'q atrofida erkin aylanishi kerak.

2. Tayanch tutqichning boshqa detallar bilan birikish joyi tasvirlangan yig'ish chizmasining fragmentini bajaring.



*1-shart yechimi varianti*

*2-shart yechimi varianti*



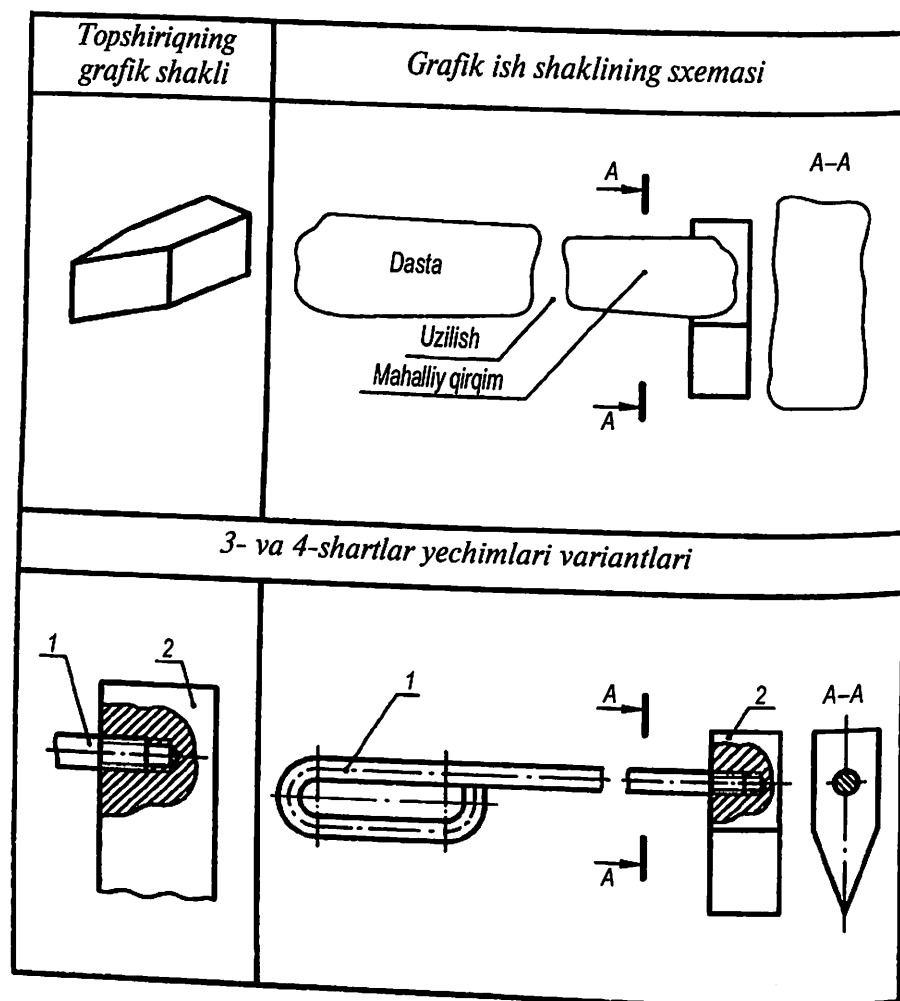
### 35. Kavsharlagich konstruksiyasini yakunlash.

*Vazifa.* 1. Kavsharlagich dastasi konstruksiyasi va dastani kavsharlagichga mahkamlash usulini ishlab chiqing.

2. Dasta chizmasini bajaring.

3. Dasta 1 ni kavsharlagich korpusi 2 ga mahkamlanish tuguni eskizini bajaring.

4. Kavsharlagich yig'ish chizmasini bajaring.



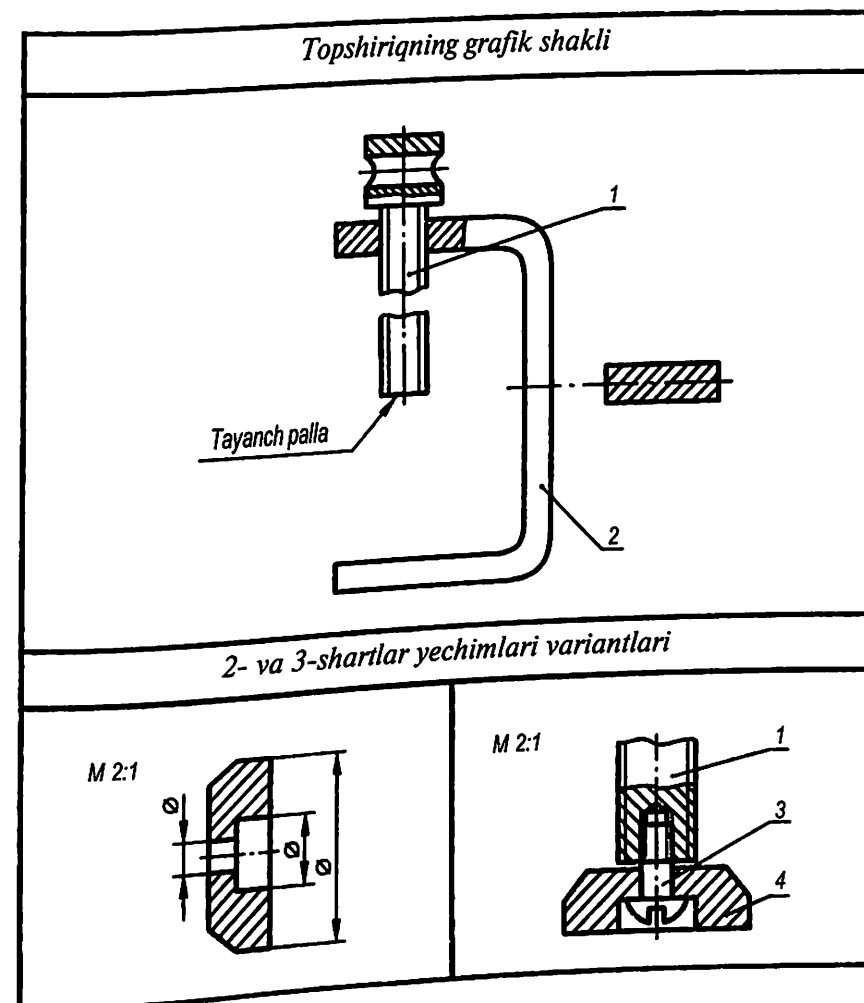
### 36. Qisqich konstruksiyasini yakunlash.

Qisqich bilan mahkamlangan detallar yoki detal tayyorlanadigan materiallarni shikastlamalik uchun halqa 2 ga burab kirgizilgan vint 1 uchiga tayanch palla 4 o'rnatiladi.

*Vazifa.* 1. Vint o'qi atrofida aylanadigan tayanch pallaning konstruksiyasi va uni mahkamlash usulini ishlab chiqing.

2. Tayanch palla chizmasini bajaring.

3. Tayanch pallaning vint 3 bilan mahkamlanish tuguni chizmasini bajaring.

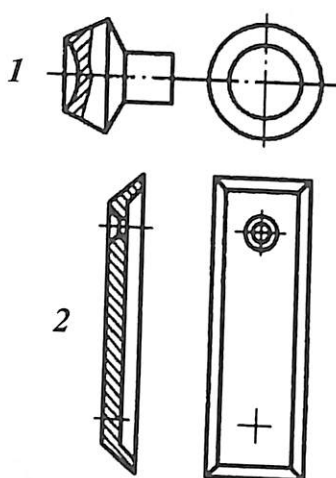
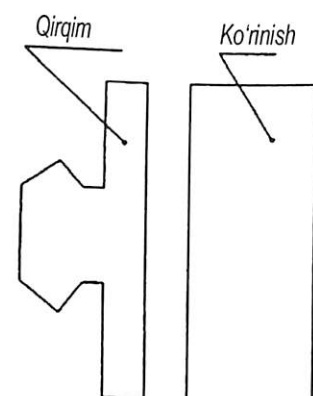
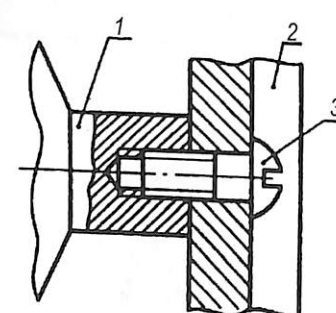
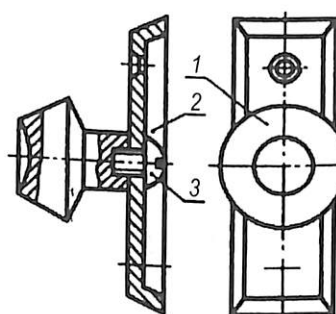


37. Eshik tutqichi konstruksiyasini yakunlash.

Vazifa. 1. Tutqich 1 ni eshik tutqichi asosi 2 ga vint 3 bilan biriktirish usulini ishlab chiqing.

2. Detallarning birikish joylari ko'rsatilgan yig'ish chizmasining fragmentini bajaring.

3. Eshik tutqichi yig'ish chizmasini bajaring.

| Topshiriqning grafik shakli                                                         | Grafik ish shaklining sxemasi                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|    |    |
| 2-shart yechimi varianti                                                            | 3-shart yechimi varianti                                                            |
|  |  |

38. Chim keskich konstruksiyasini yakunlash.

Ayrim yerlarning ustki qatlamlarida o'simliklarning ildizlari (chim) chirmashib ketganligi sababli bunday yer qatlamlarini qazish va chopish qiyin bo'ladi. Chim keskich o'simlik ildizlarini kesib yerga ishlov berishni osonlashtirishga xizmat qiladi. Shaklda chim keskichning kesuvchi diski tasvirlangan.

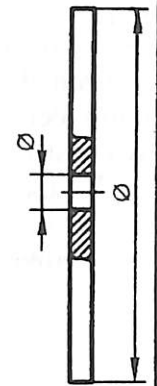
Vazifa. 1. Disk tutqichi konstruksiyasini ishlab chiqing.

2. Konstruksiyaning asosiy detallari chizmalarini bajaring.

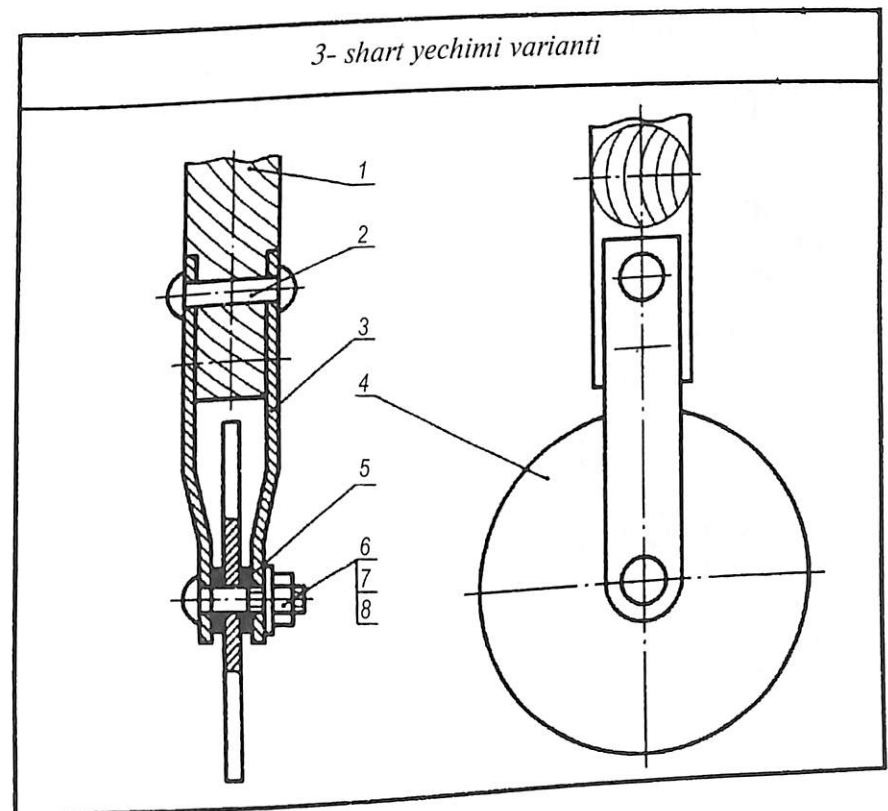
3. Chim keskich yig'ish chizmasini bajaring.

Eslatma. Ushbu va keyingi topshiriqlar va ularni bajarish namunalarida matnda keltirib o'tilmagan pozitsiya (detallarning joylashish vaziyati) raqamlaridan foydalanish mumkin.

Topshiriqning grafik shakli



Chim keskich diski



### 39. Shtativ konstruksiyasini yakunlash.

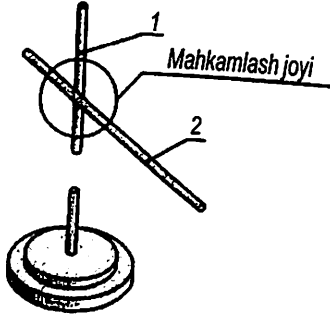
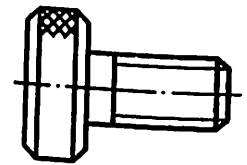
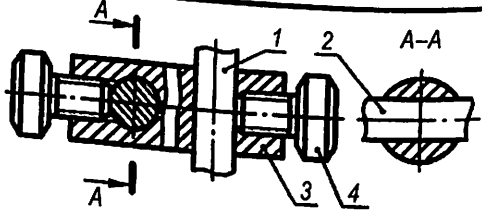
Laboratoriyalarda turli ishlar uchun shtativlardan foydalaniladi. Shtativ yuqoriga va pastga, shuningdek, o'ngga va chapga harakatlanadigan vertikal tayoqcha 1 va gorizontaal tayoqcha 2 lardan tashkil topgan bo'ladi.

**Vazifa.** 1. Berilgan yo'nalish bo'yicha 2-detalni 1-detalg nisbatan ko'chirish imkonini beradigan suriladigan mahkamlash vositasi konstruksiyasini ishlab chiqing.

2. Vertikal va gorizontaal tayoqchalarni biriktiradigan asosiy detal chizmasini bajaring.

3. Mahkamlash tuguni yig'ish chizmasini bajaring.

4. Shtativning yig'ilgan vaziyatdagi texnik rasmini bajaring.

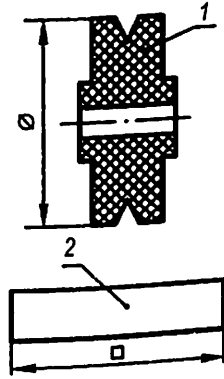
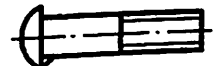
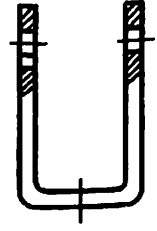
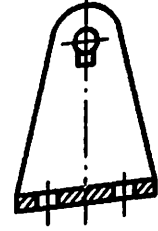
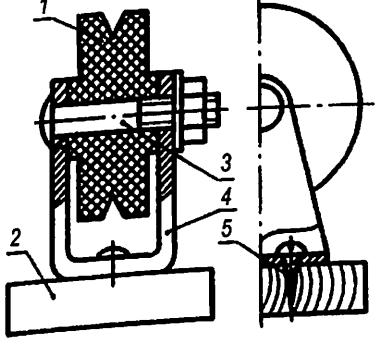
| Topshiriqning grafik shakli                                                                                                                                                | Tavsiya qilinadigan vint                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                          |    |
| 2- va 3-shartlar yechimlari variantlari                                                                                                                                    |                                                                                     |
| <br> |  |

### 40. Rolik konstruksiyasini yakunlash.

**Vazifa.** 1. Rolik 1 ga, yog'och asos 2 ga parallel o'q atrofida aylanish imkonini beradigan ustun konstruksiyasini ishlab chiqing.

2. Ustun chizmasini bajaring.

3. Orqaga buralishiga qarshilik qiladigan mo'ylovchali bolt va shuruplardan foydalanib rolikning yig'ish chizmasini bajaring.

| Topshiriqning grafik shakli                                                                                                                                                 | Tavsiya qilinadigan detallar                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                          | <p>a) mo'ylovli bolt</p>  <p>b) yarimaylana kallakli bolt</p>  |
| 2- va 3-shartlar yechimlari variantlari                                                                                                                                     |                                                                                                                                                                                                                                      |
|   |                                                                                                                                                  |

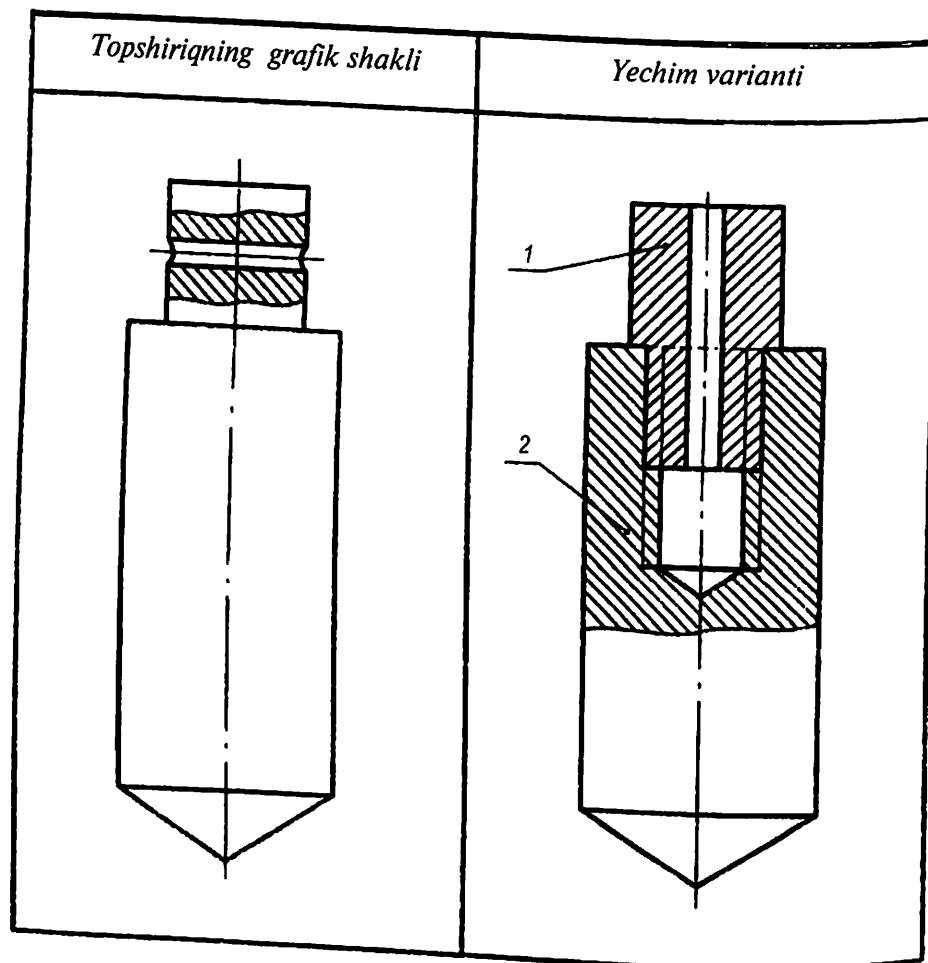
**41. Shoqul konstruksiyasini takomillashtirish.**

Shoqul konstruksiyalar va ular elementlarining vertikal vaziyatini tekshirishda qo'llaniladi.

*Vazifa:* 1. Shoqul tuzilishini o'rganing, uning asosiy kamchiligini aniqlab ayting.

2. Shoqul konstruksiyasini shunday takomillashtiringki, bunda, chilvir tuguni korpus ichida ko'rinmaydigan bo'lib joylashsin, korpus o'qi esa chilvir yo'nalishi bilan ustma-ust tushsin.

3. Mahsulotning konstruksiyasi o'zgargandan keyingi chizmasini bajaring.

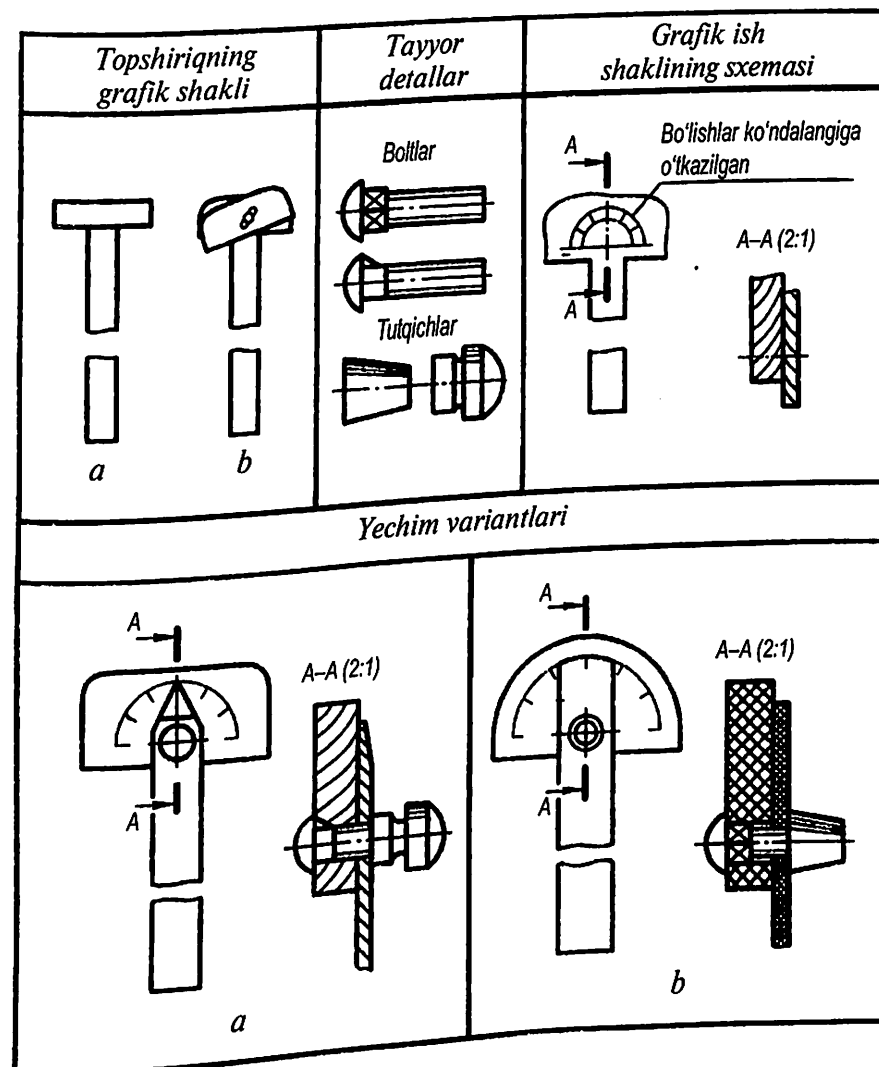


**42. Reysshina konstruksiyasini takomillashtirish.**

*Vazifa:* 1. Reysshinaning ishlatilish sohasi va tuzilishini o'rganing (a — o'quvchilar uchun, b — mutaxassislar uchun). Reysshinalarning ushbu konstruksiyalaridagi asosiy kamchiliklarni aniqlab, ayting.

2. Reysshina konstruksiyasini shunday takomillashtiringki, uning yordamida berilgan har qanday burchak ostidagi o'zaro parallel chiziqlarni o'tkazish mumkin bo'lsin.

3. Kombinatsiyalashtirilgan reysshinaning yig'ish chizmasi (eskizi)ni bajaring.



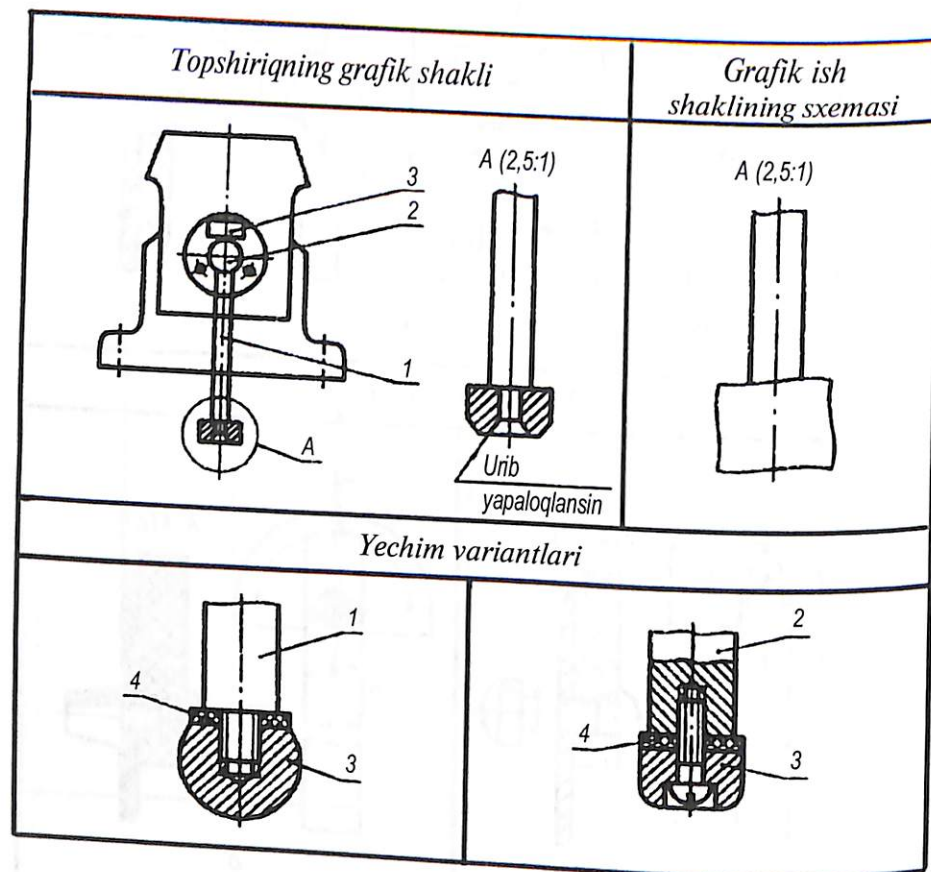
### 43. Tiski dastasi konstruksiyasini takomillashtirish.

Parmadasta 1 ning uchi urib yapaloqlanib, unga kiritilib mahkamlangan ikkita tayanch shayba 3 lar bilan vint 2 dan tushib ketmasdan turadi. Bunday usulda biriktirilgan detallarni qismlarga ajratib bo'lmaydi. Bundan tashqari, parmadasta tez aylantirilganida metallning qattiq taqillagan ovozi – ustaxonada baland shovqin manbasi paydo bo'ladi.

**Vazifa.** 1. Ko'rsatilgan qurilmaning kamchiliklarini aniqlab ayting.

2. Tiskida ishlagan paytda paydo bo'ladigan shovqinni yo'qotish zaruriyatini e'tiborga olgan holda parmadasta va shaybaning qismlarga ajraladigan konstruksiyasini ishlab chiqing (shakldor gayka, tutqich va h.k.).

3. Yig'ish chizmasining parmadastaning birikish joyi fragmentini bajaring.



### 44. Proporsional sirkul konstruksiyasini takomillashtirish.

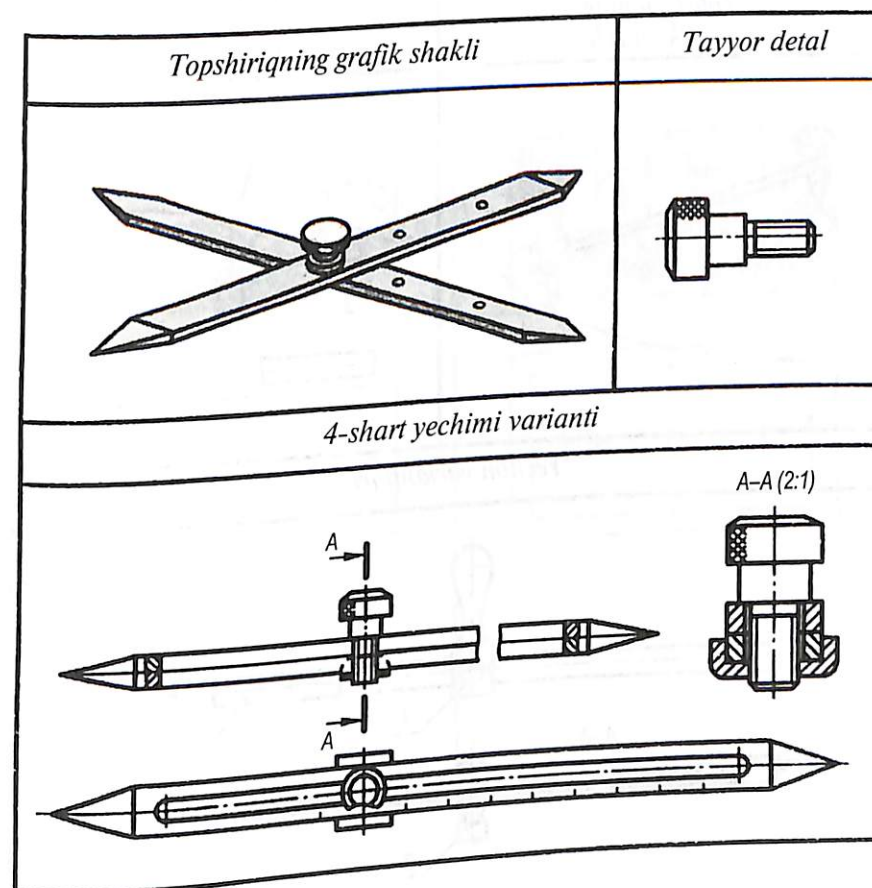
Asbobdan tasvirlarni proporsional ravishda kattalashtirish yoki kichraytirishda foydalaniladi. Asbobning tuzilishiga ko'ra masshtab o'zgarishining uchta variantidan foydalanish mumkin.

**Vazifa.** 1. Ko'rsatilgan qurilmaning kamchiligini aniqlab, ayting.

2. Asbob tuzilishini shunday o'zgartiringki, bunda masshtablarni o'zgartirish soni cheklanmagan bo'lsin.

3. Asbobning asosiy detallari texnik rasmi yoki chizmasini bajaring.

4. Proporsional sirkul konstruksiyasi takomillashgandan keyingi yig'ish chizmasini bajaring.





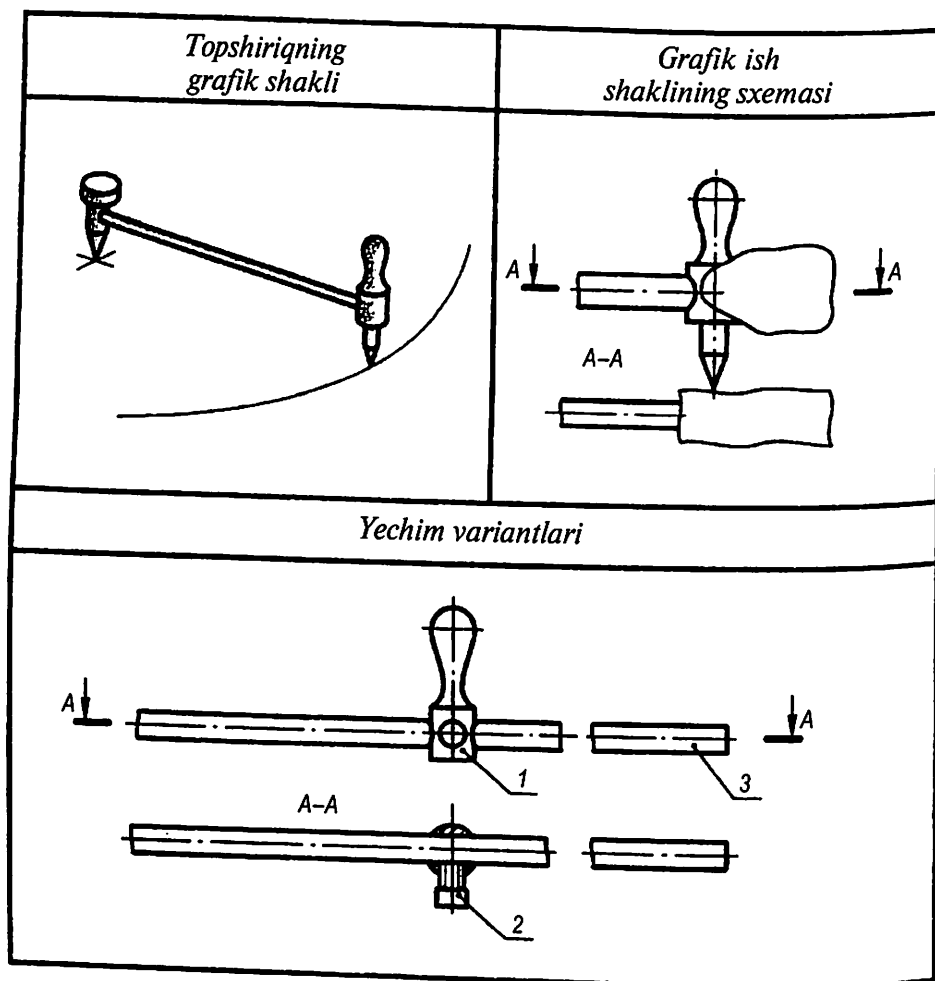
**45.** Rejalash sirkuli konstruksiyasini takomillashtirish.

Ushbu sirkuldan o'zgaras radiusli katta aylanalarni rejalashda foydalaniladi.

*Vazifa.* 1. Tasvirlangan qurilmani o'rganib chiqing va asosiy kamchiligini aniqlab, ayting.

2. Sirkul tuzilishini shunday o'zgartiringki, bunda uning yordamida ixtiyoriy radiusdagi aylanalarni rejalashtirish mumkin bo'lsin.

3. O'zgartirilgandan keyingi qurilma fragmentining chizmasini bajaring.

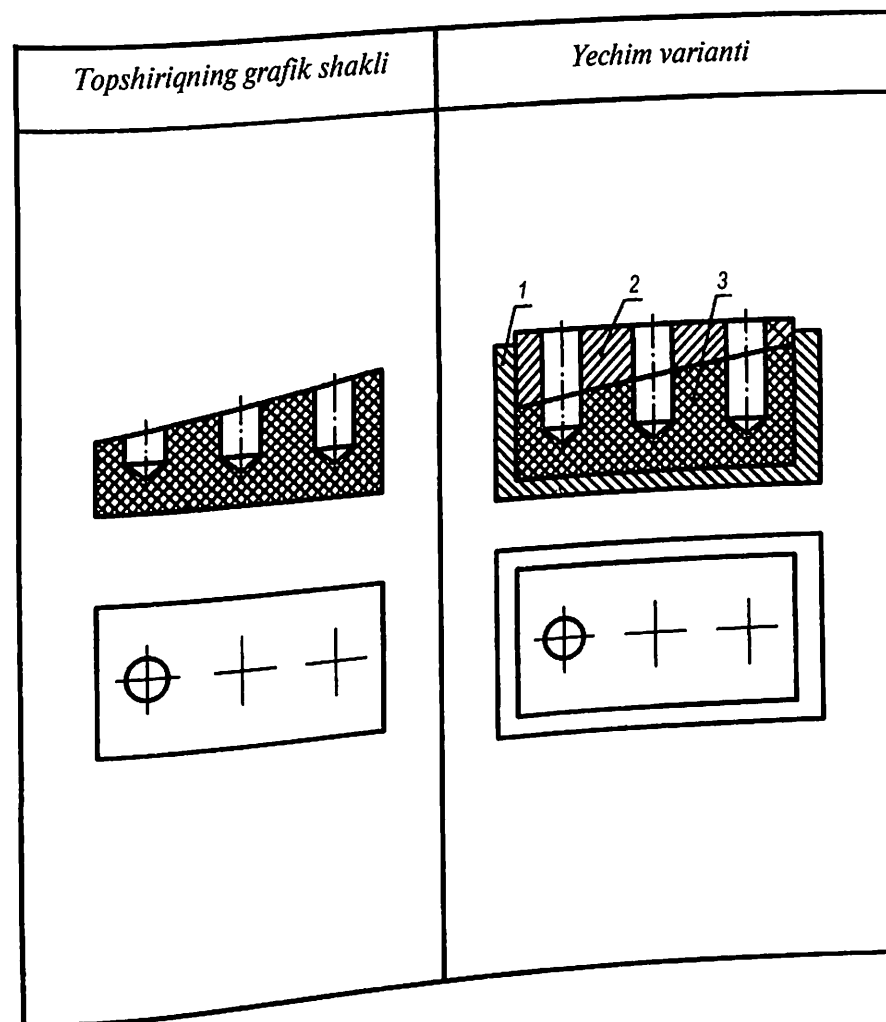


**46.** Qiya sirtida teshik parmalash uchun moslama loyihalash.

Parma teshik ochiladigan joydan surilib ketmasligi uchun uni shu joyga perpendikular joylashtirish zarur bo'ladi.

*Vazifa.* 1. Berilgan detalning qiya tarafidan teshik ochishda foydalanish mumkin bo'lgan moslama konstruksiyasini loyihalang.

2. Moslamaning yig'ish chizmasini bajaring.

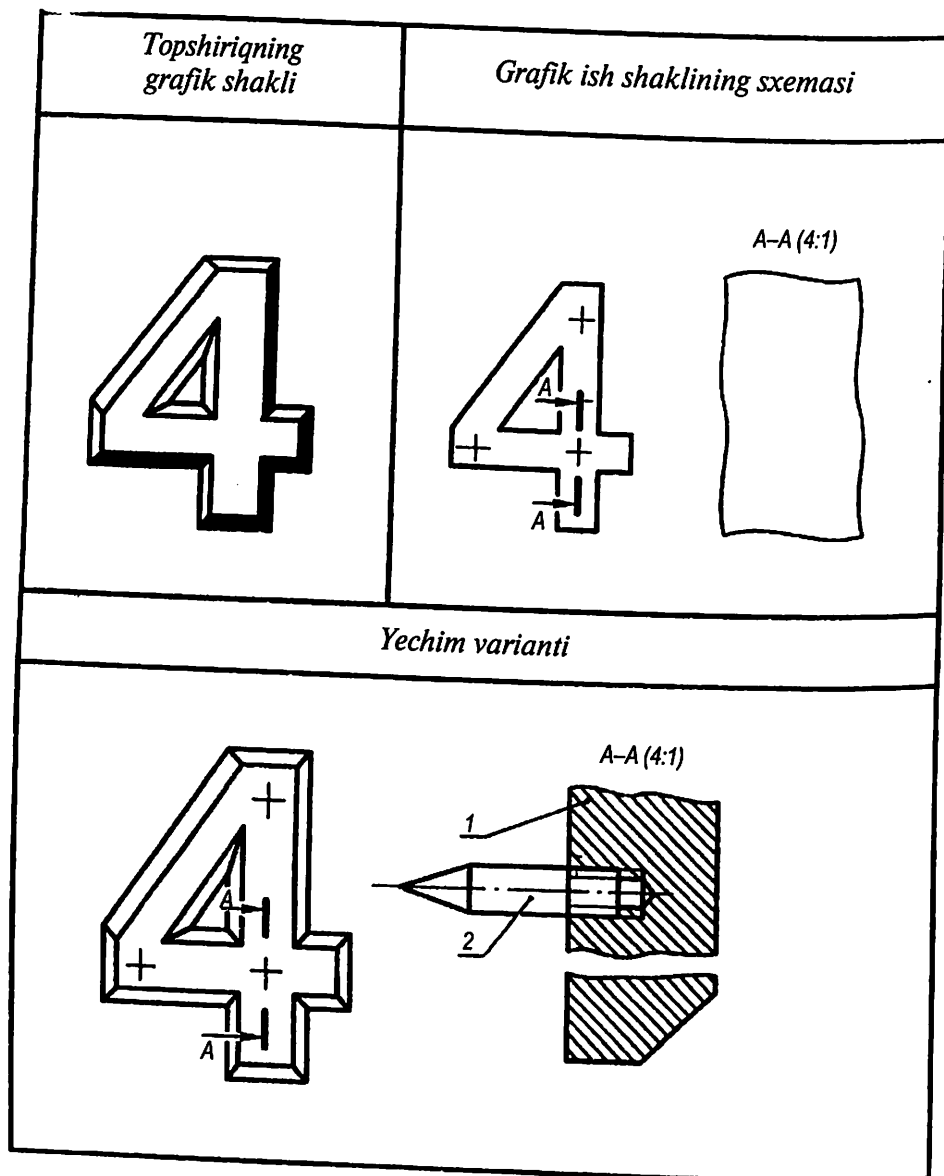




47. Kirish eshiklariga hajmli raqamlarni mahkamlash usulini ishlab chiqish.

Vazifa. 1. Aluminiy qotishmasidan tayyorlangan raqamlarni eshik taxtasiga mahkamlash usulini ishlab chiqing.

2. Mahkamlashning taklif qilinayotgan usulini tushuntiruvchi chizma bajaring.



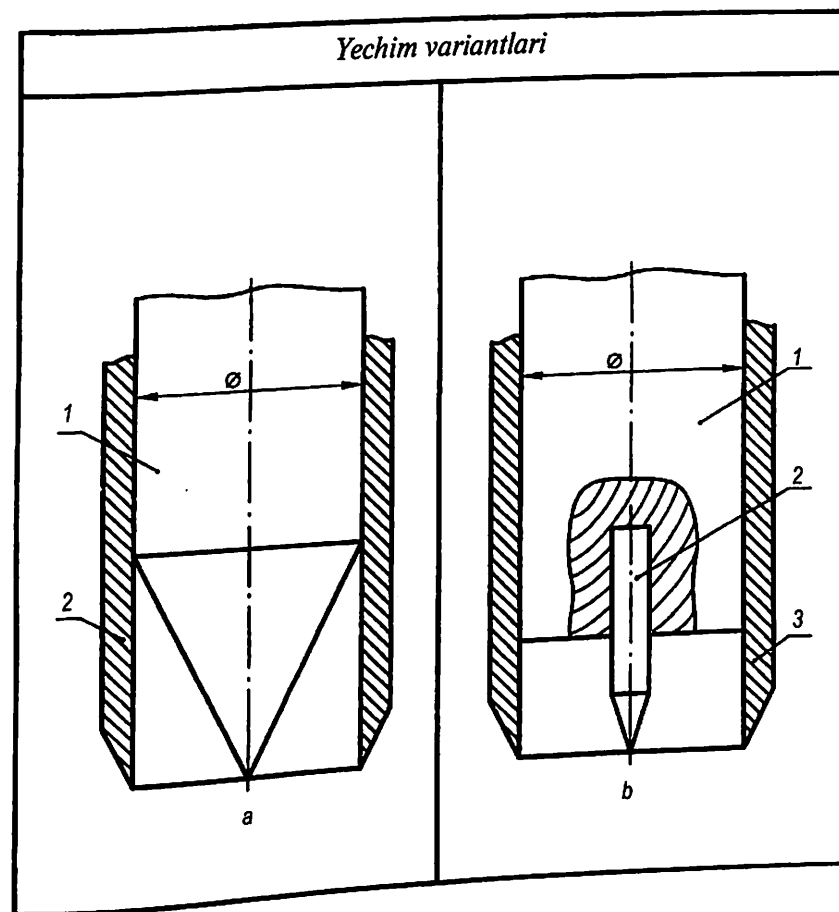
48. Fanerda teshik ochish moslamasini loyihalash.

Fanerda (ayniqsa, diametri katta bo'lgan) teshik ochish uchun yupqa devorli po'lat trubka (quvur)lardan foydalanish mumkin.

Vazifa. 1. Parmalashda teshik markaziga nisbatan trubkaning siljishini oldini oladigan yo'naltirgich konstruksiyasini loyihalang.

2. Yo'naltirgich chizmasini bajaring.

3. Fanerda teshik parmalaydigan moslamaning chizmasi (eskizi)ni bajaring.

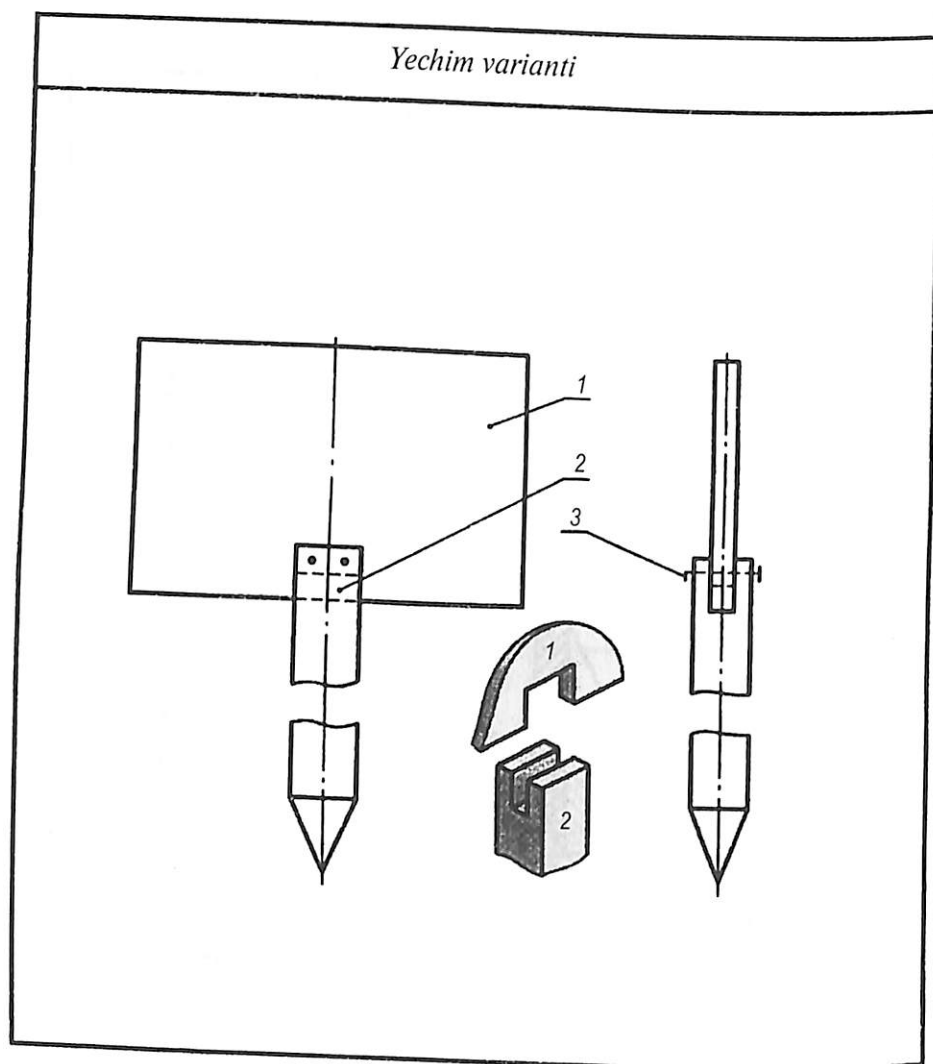


49. Polizga o'rnatiladigan ma'lumot yozilgan taxtacha tayyorlash.

*Vazifa.* 1. Polizga o'rnatiladigan ma'lumot yozilgan taxtacha loyihasini ishlab chiqing. Taxtacha  $160 \times 100 \times 3$  mm li faner plastinkasidan va 200 mm uzunlikdagi oyoqchadan iborat bo'lishi kerak. Detallarni mahkamlash usulini mustaqil tanlang.

2. Taxtacha detallarining chizmalarini bajaring.

3. Mahsulotning yig'ish chizmasini bajaring.



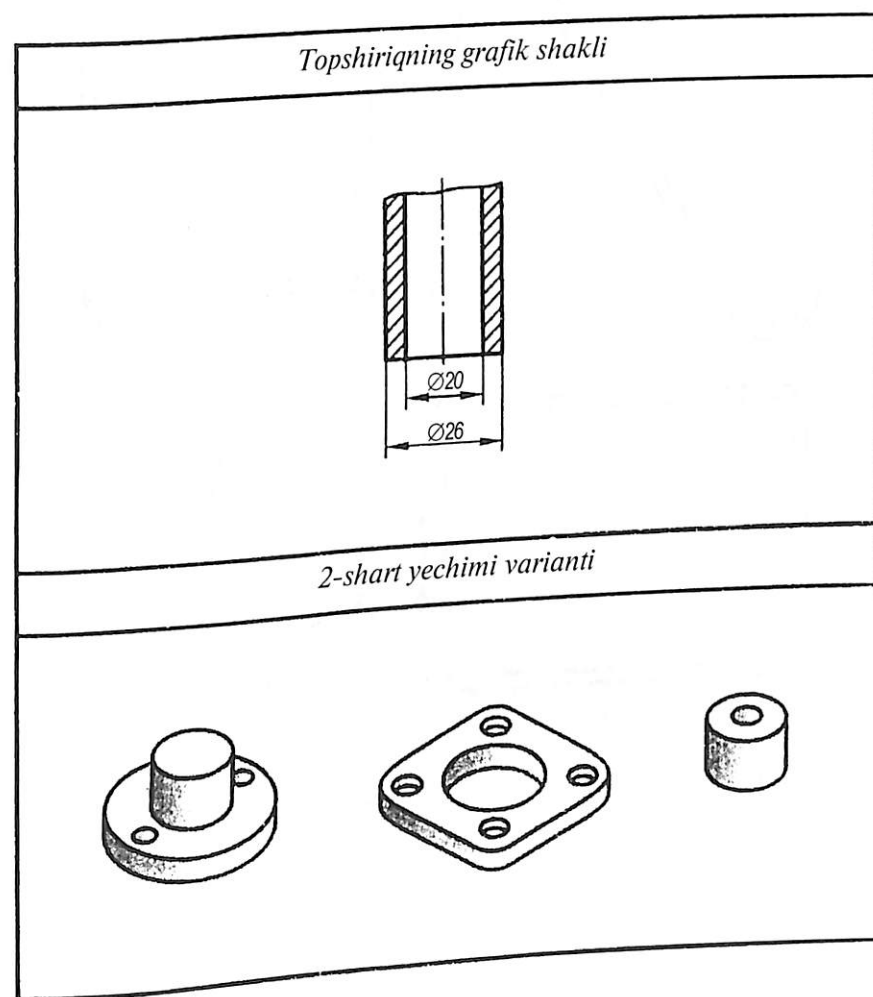
50. Chizmachilik kabineti stollari joylashish o'rini belgilovchi qurilmani loyihalash.

Chizma stoli oyoqlari metall truba (quvur)lardan tayyorlanadi. Chizmada trubaning ichki va tashqi diametrlari millimetrlarda berilgan.

*Vazifa.* 1. Chizmachilik stolini xonani tozalash paytida ko'tarish va undan keyin avvalgi joyiga qaytarib qo'yish imkonini beradigan, uni polga mahkamlash qurilmasi konstruksiyasini loyihalang.

2. Mahkamlash asosiy detalining chizmasi yoki texnik rasmini bajaring.

3. Mahkamlashning yig'ish chizmasini bajaring.

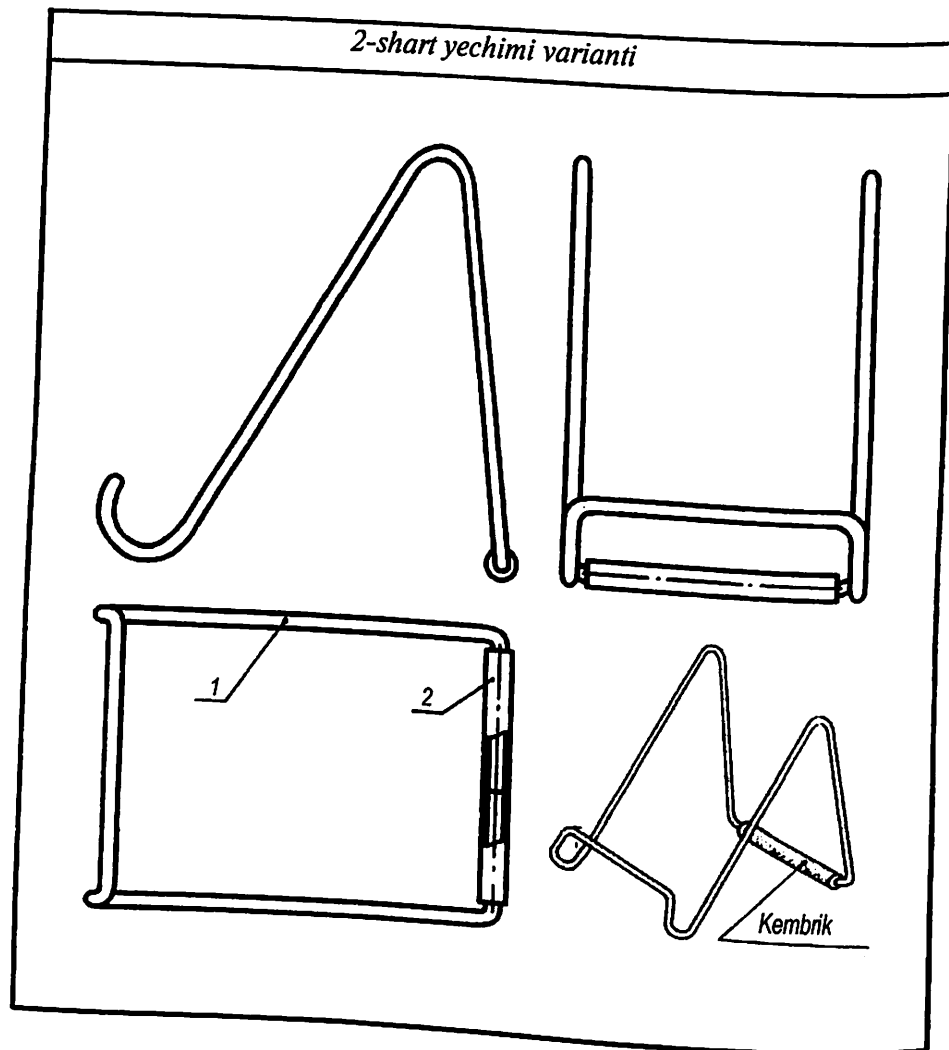


### 51. Kitob uchun taglik loyihalash.

Vazifa. 1. Simdan kitob uchun taglik konstruksiyasini ishlab chiqing.

2. Taglik chizmasini bajaring.

3. Taglik texnik rasmini bajaring.



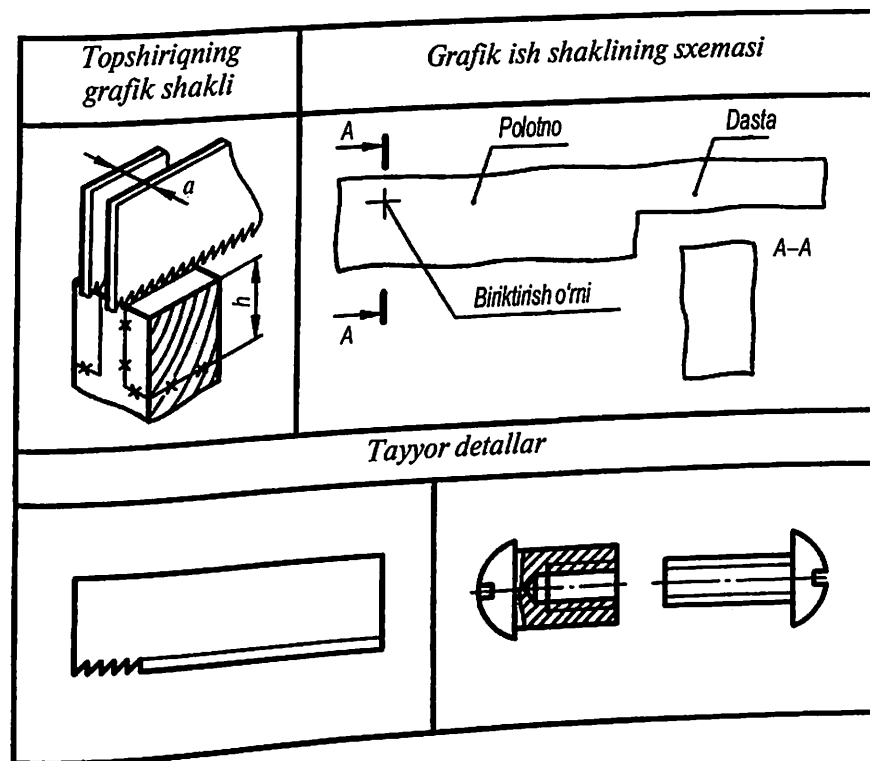
### 52. Yog'och materiallarga tirnoq kesish moslamasini loyihalash.

Yog'och birikmalarni tayyorlashda ularda tirnoqlar kesib biriktiriladi. Bu ishni juft arra ko'rinishidagi moslamada bajarish qulay. Arralar polotnolari orasidagi masofa tirnoq eniga teng bo'lishi, polotnolarni birlashtiruvchi kashak (ulagich) esa zarur balandlikdagi tirnoq kesish imkonini berishi kerak.

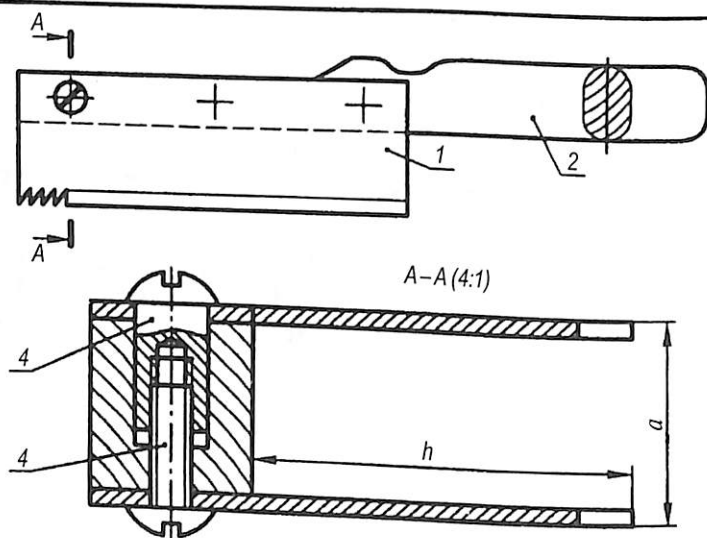
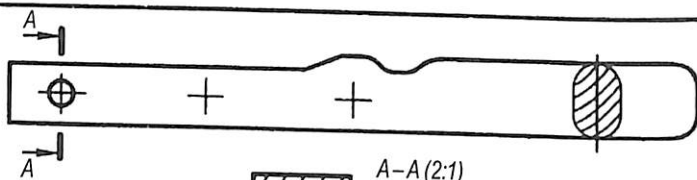
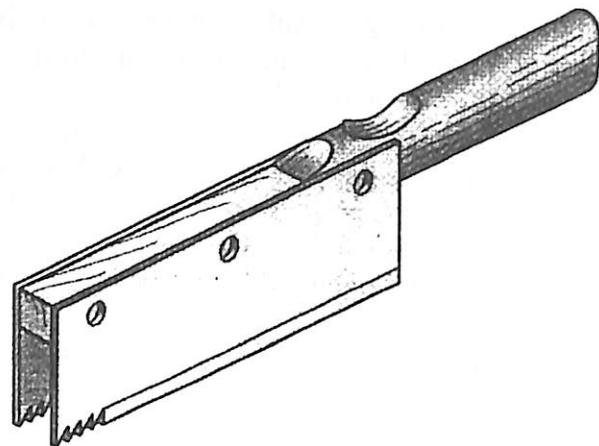
Vazifa. 1. Eni  $a$  va balandligi  $h$  bo'lgan yog'och materiallarga tirnoq kesish moslamasi konstruksiyasini loyihalang. Konstruksiya loyihasini bajarishda tavsiya qilinadigan tayyor materiallardan foydalanilsin.

2. Arra polotnolari orasida joylashgan kashak chizmasini bajaring.

3. Tirnoq kesish moslamasining texnik rasmi yoki yig'ish chizmasini bajaring.

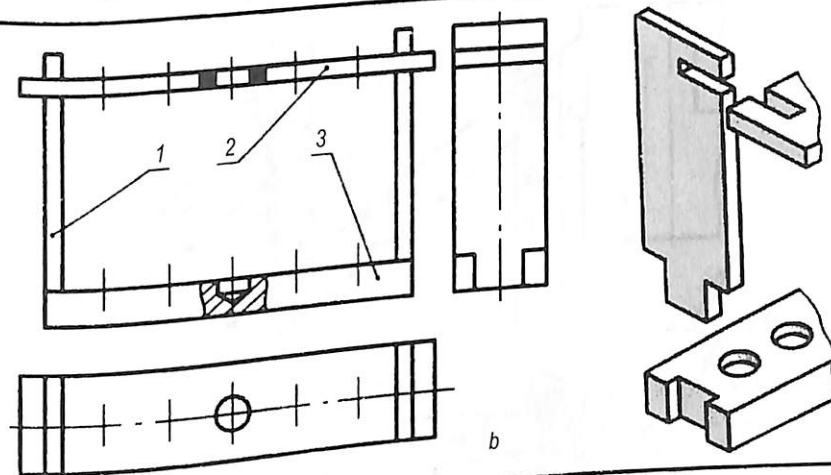
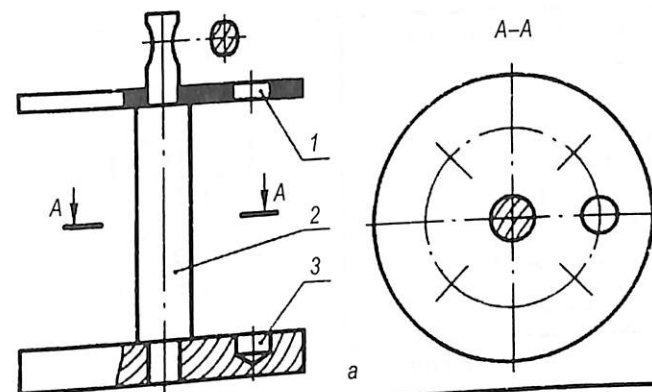


2- va 3- shartlarning yechim variantlari



53. Probirkalar uchun tirgak loyihalash.  
 Vazifa. 1. Beshta probirka uchun tirgak loyihasini ishlab chiqing.  
 2. Tirgak detallarining chizmalari (texnik rasmlari)ni bajaring.  
 3. Tirgakning yig'ish chizmasini bajaring.

3-shart yechimi variantlari



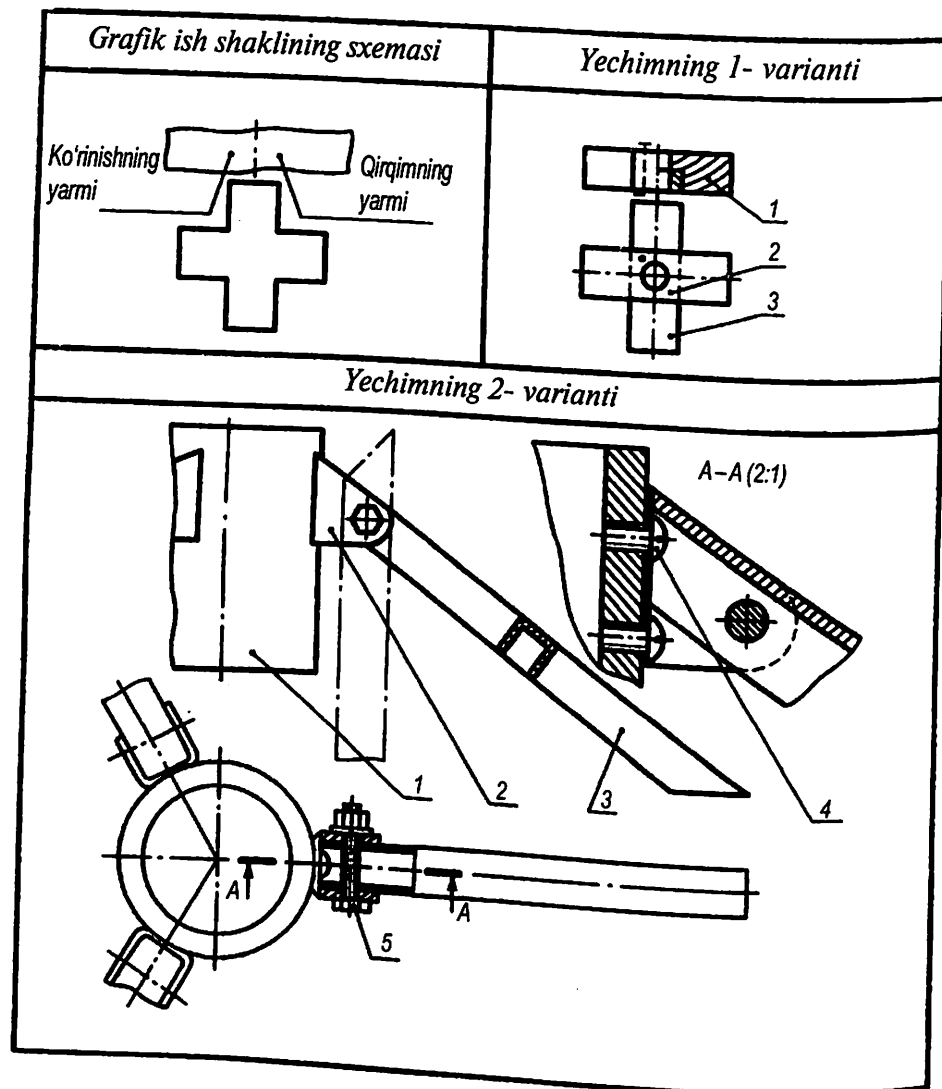
54. Archa o'rnatish uchun mahkamlagich loyihalash.

Vazifa. 1. Yangi yil archasini o'rnatish uchun xochsimon mahkamlagich loyihasini ishlab chiqing.

2. Yangi yil archasini o'rnatish uchun yig'ma metall konstruksiya loyihasini bajaring.

3. Mahkamlagichning asosiy detallari chizmasini bajaring.

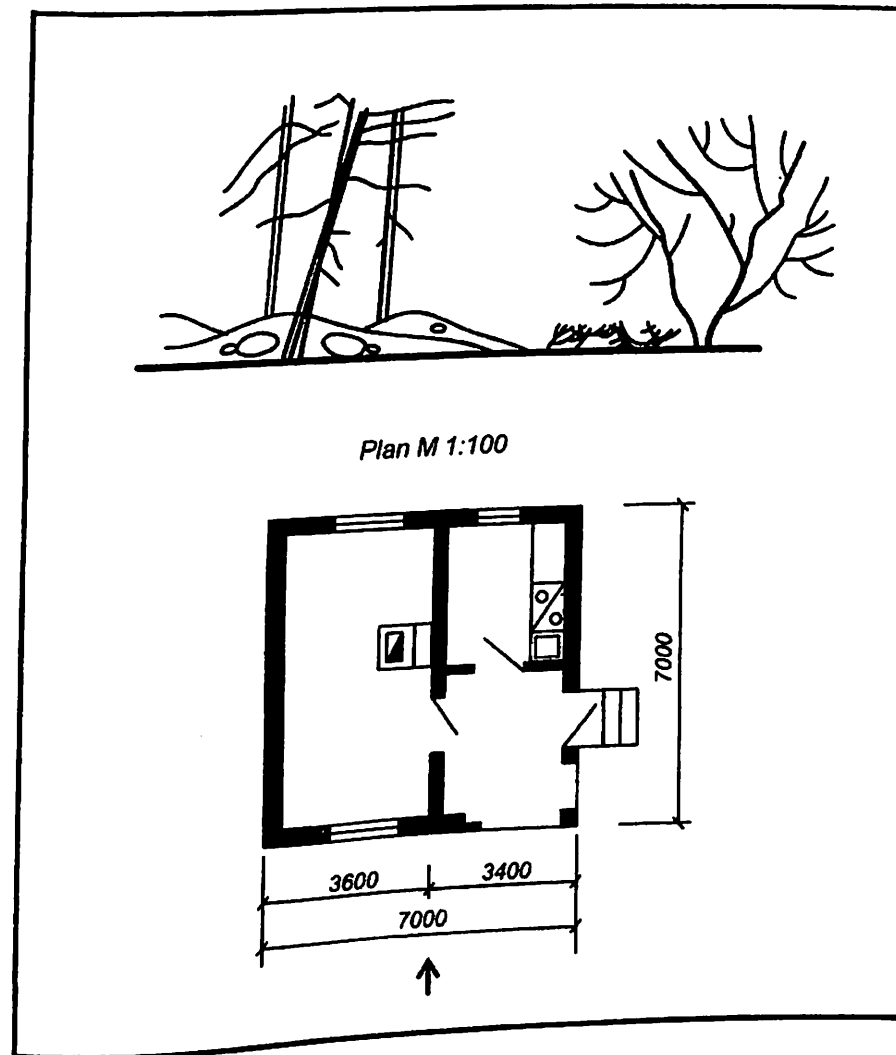
4. Mahkamlagichning yig'ish chizmasi va texnik rasmini bajaring.



55. Dala hovli plani bo'yicha fasadini loyihalash.

Vazifa. 1. Dala hovlining berilgan plani bo'yicha fasadini loyihalang.

2. Dala hovli chizmasini atrof-muhiti tasvirlangan shaklda bajaring.



*Yechim variantlari (plan ko'rsatilmagan)*



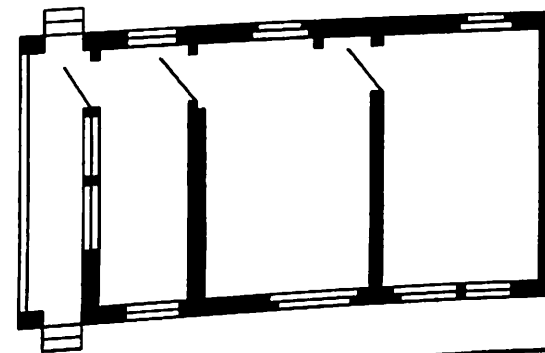
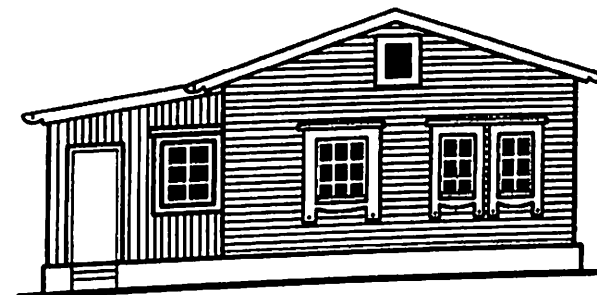
*a*



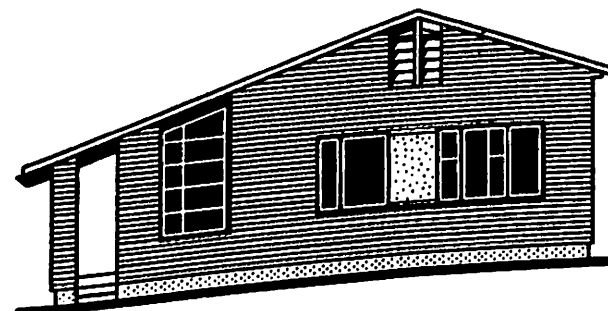
*b*

**56.** Bino tashqi ko'rinishi sifatini yaxshilash.

*Vazifa.* Bino planini o'zgartirmasdan, unga ko'proq arxitekturaliy ifodalilik va zamonaviy shakl berish maqsadida fasadini o'zgartiring.

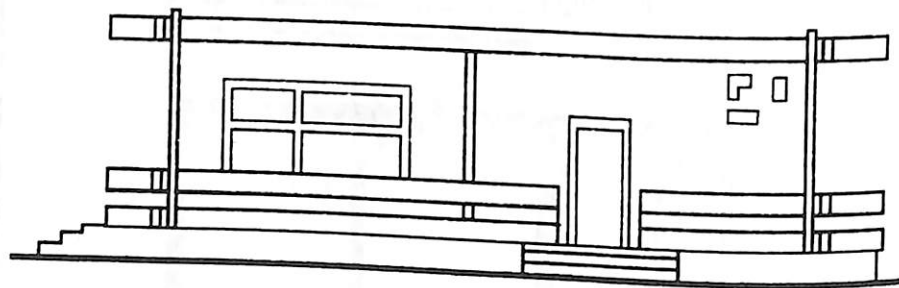


*Yechim varianti*



**57. Dala hovli fasadi bo'yicha:**

- 1) uning planini quring: plan va fasadda rejalash o'qlarini o'tkazib, belgilang; plan va fasadni belgilang;
- 2) bino ichki xonalarining joylashishini rejalashtirib, planda tasvirlang va ularning tafsilotli ro'yxatini tuzing, planda xonalarining joylashishini belgilab chiqing;
- 3) deraza va eshik o'rinlarini qanday shaklda tanlashingizni aniqlang va ularni planda tasvirlang;
- 4) bino qirqimini quring va qirqimda materiallarini belgilang;
- 5) bino xonalarida mebellarni joylashtirib, sanitar-texnik jihozlarni planda tasvirlang;
- 6) plan va fasadda bino gabarit o'lchamlarini ko'rsating.



**58. Sodda arxitekturaviy kompozitsiyalar chizmalarini loyihalash va bajarish (hajmli kompozitsiya).**

Topshiriq mazmuni turli darajadagi: grafik asosda (III) yoki grafik asossiz (IV) aniqlashtirilgan ko'rinishida shakllangan bo'lishi mumkin.

**Vazifa III.** 1. Asosiy ko'rinishi bo'yicha, qo'shilib turgan geometrik jismlardan tashkil topgan hajmli kompozitsiya loyihasini bajaring.

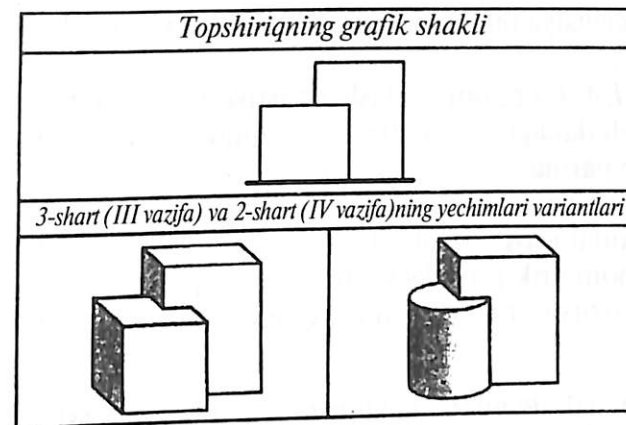
2. Asosiy ko'rinishni chizmani qayta qurish imkonini beradigan qo'shimcha tasvirlar bilan to'ldiring.

3. Kompozitsiya tasvirini aksonometriyada bajaring.

4. Kompozitsiya maketini uning elementlari yoyilmalari bo'yicha bajaring. Maketni kartonga yelimlang.

**Vazifa IV.** 1. Qo'shilib turgan quyidagi elementlardan tashkil topgan hajmli kompozitsiya loyihasini:

- a) parallelepipedlar;
- b) silindrlar;
- d) boshqa geometrik jismlarda bajaring.



2. Kompozitsiya tasvirini:

a) ortogonal proyeksiyalarda;

b) aksonometriya yoki texnik rasmini bajaring.

3. Kompozitsiya maketini uning elementlari yoyilmalari bo'yicha bajaring.

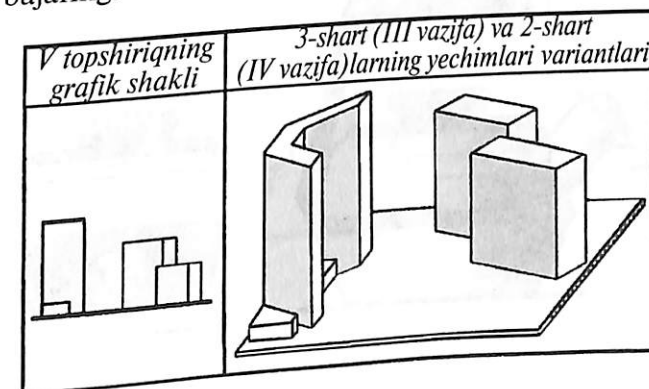
**59. Sodda arxitektura kompozitsiyalari chizmalarini loyihalash va bajarish (hajmli-fazoviy kompozitsiya).**

Topshiriq mazmuni turli darajadagi: grafik asosda (V) yoki grafik asossiz (VI) aniqlashtirilgan ko'rinishida shakllangan bo'lishi mumkin.

**Vazifa V.** 1. Asosiy ko'rinishi bo'yicha hajmli-fazoviy kompozitsiya loyihasini bajaring.

2. Asosiy ko'rinishni chizmani qayta qurish imkonini beradigan qo'shimcha tasvirlar bilan to'ldiring.

3. Ishlangan kompozitsiya tasvirini aksonometriya yoki texnik rasmda bajaring.



4. Kompozitsiya maketini uning elementlari yoyilmalari bo'yicha bajaring.

*Vazifa VI.* 1. Gorizontalk tekislikda ixtiyoriy vaziyatda joylashgan prizmatik shakldagi elementlardan hajmli-fazoviy kompozitsiya loyihasini bajaring.

2. Kompozitsiya tasvirini:

a) ortogonal proyeksiyalarda;

b) aksonometrik proyeksiyalarda bajaring.

3. Kompozitsiya maketini uning elementlari yoyilmalari bo'yicha bajaring.

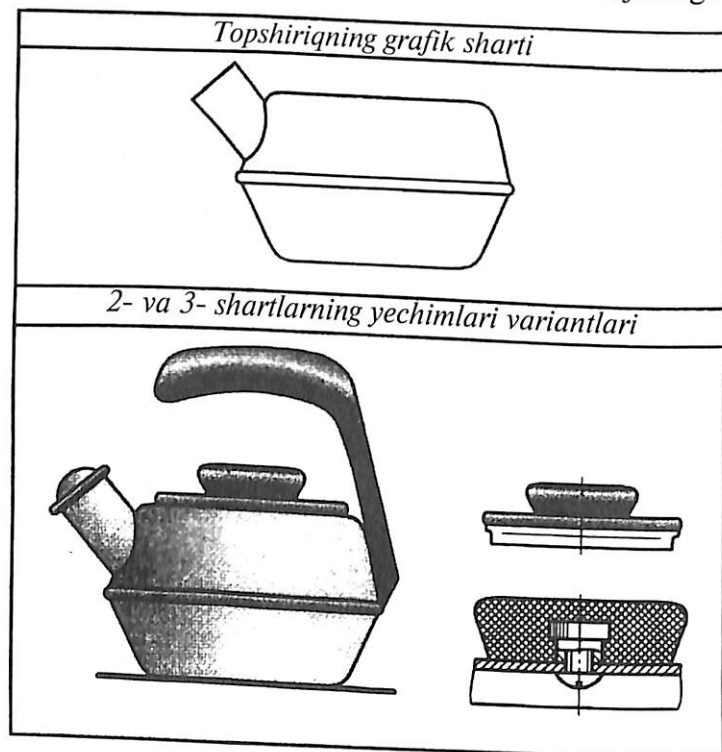
**60.** Choynak detallari shaklini mukammallashtirish.

*Vazifa.* 1. Choynak korpusining berilgan shakliga mos keladigan qopqoq (tutqich, hushtak)ning tashqi shaklini loyihalang.

2. Loyihalangan detallar shaklini aniqlashtirib, choynak tasvirini rangli qog'oz applikatsiyasi texnikasida bajaring.

3. Qopqoq chizmasini unga tutqich mahkamlanish usuli tasvirlangan ko'rinishda bajaring.

4. Choynak tutqichining uning korpusiga mahkamlanish tizimini ishlab chiqing va mahkamlanish joyi chizmasini bajaring.



**61.** Qanddon detallari shaklini mukammallashtirish.

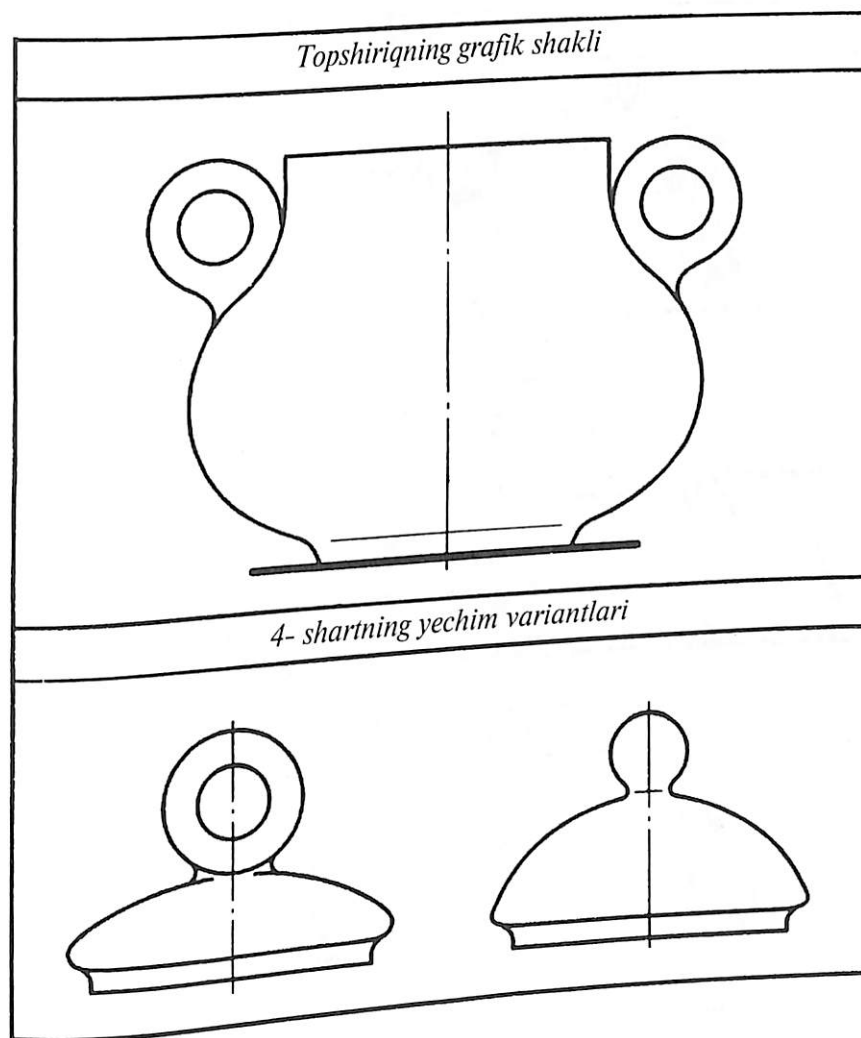
*Vazifa.* 1. Korpusning berilgan tasviriga o'lchamlarni qo'ying.

2. Korpusning berilgan shakli bo'yicha qanddon qopqog'i shaklini loyihalang.

3. Qopqoq eskizini o'lchamlari ko'rsatilgan holda tasvirlang.

4. Eskiz bo'yicha qopqoq chizmasini bajaring.

5. Tutashmalarni qurish yordamida qanddon chizmasini bajaring.



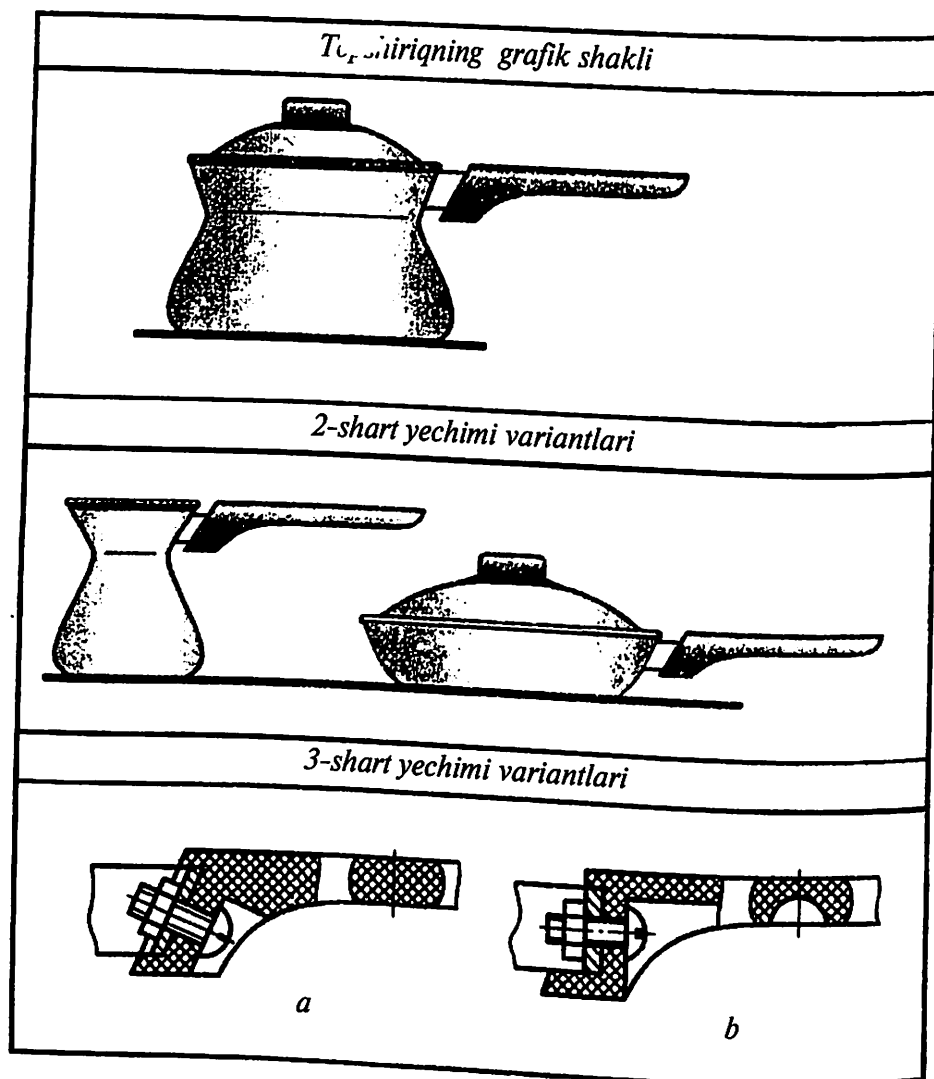


62. Birining stilistik belgilari bo'yicha buyumlar guruhi tashqi shaklini loyihalash.

*Vazifa.* 1. Kastrulkaning berilgan shakliga o'xshaydigan qahva qaynatgich va qopqoqli tovalarning tashqi shaklini loyihalang.

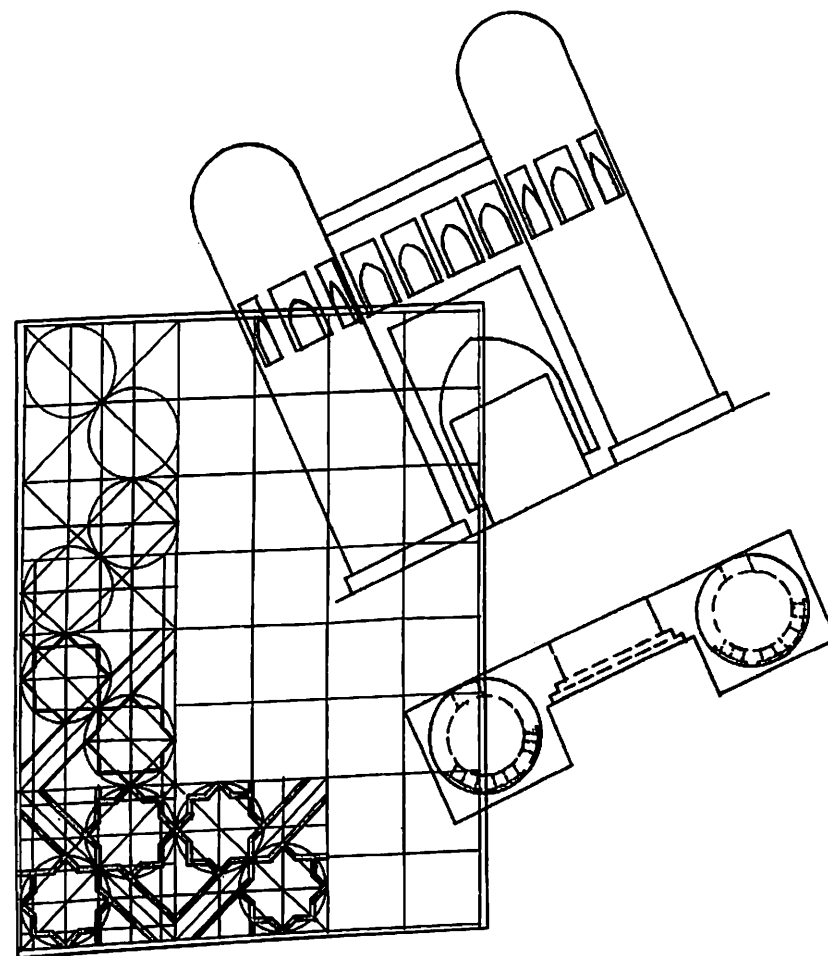
2. Loyihalangan buyumlarning chizmalarini bajaring.

3. Buyumlarning ixtiyoriy birining korpusiga tutqichni mahkamlash tizimini ishlab chiqing.



## VIII QISM. AMALIY GRAFIKA VA ARXITEKTURAVIY LOYIHALASH ASOSLARI

*(to'garak va fakultativ mashg'ulotlar uchun)*



## GRAFIK VA DIAGRAMMALAR

Grafik va diagrammalar axborot uzatishning bir shakli bo'lib, ular o'zining ixchamliligi, mazmunliligi, universalliligi va tushunarlilik bilan ajralib turadi. Ulardan insonlar kundalik turmushida va kasbiy faoliyatlarida foydalanadilar.

Grafik va diagrammalar fan, texnika, tibbiyot, maorif va turmushda keng qo'llaniladi. Fanda ular yordamida har xil murakkab jarayonlarning kechishi va qonuniyatlari o'rganiladi, tibbiyotda tashxis qo'yishda (kardiogrammalar va h.k.) foydalaniladi, ishlab chiqarish, maorif va shu kabilarda ma'lum bir davr mobaynida biror sohadagi ko'rsatkichlarning o'zgarishlari sodda va tushunarli shaklda ifodalanadi.

O'quvchilar grafik va diagrammalar bilan matematika, fizika, iqtisodiy bilim asoslari, mehnat ta'limi darslarida va shuningdek, gazeta hamda jurnallarni mutolaa qilish jarayonlarida tanishganlar. Shuning uchun biz grafik va diagrammalarni o'qish va bajarishni bilishning foydasi va zaruriyati haqida to'xtalib o'tirmaymiz.

*Grafik* (grek. *graphikos* – chizma) biror kattalik (funksiya)ning ikkinchi kattalik (dalil) o'zgarishiga bog'liq holda, o'zgarishining grafik shakldagi tasviridir (1- shakl).

Inson faoliyatining statistika, hisob-kitob va boshqa sohalarida grafiklar jarayonlarning miqdoriy bog'liqligini yaqqol tasvirlash uchun keng qo'llaniladi. Masalan, rejaning oylar yoki yillar bo'yicha bajarishning borishi grafigi, mamlakat aholi sonining yillar bo'yicha o'sishi grafigi va hokazolar.

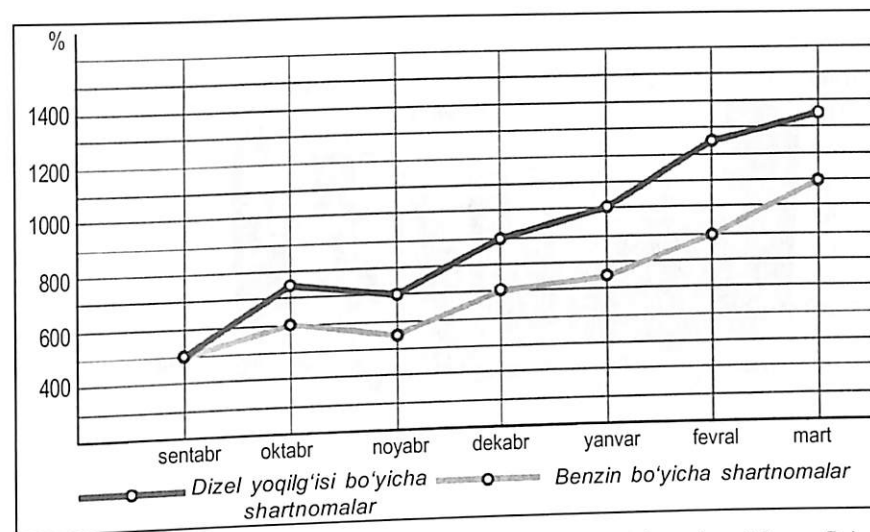
Diagrammalar ustunli yoki sektorli ko'rinishlarda bo'lishi mumkin. Ustunli diagrammalarda kattaliklar ustun shaklida masshtabli tasvirlanadi (2–3-shakllar). Sektorli diagrammalar odatda yaxlit bir butun tarkibiy qismlarning nisbatlarini tasvirlash maqsadida qo'llaniladi (4–8-shakllar). Bunday diagrammani qurish uchun aylana fikran 100 ta teng bo'lakka bo'linadi.

Quyida grafik va diagrammalar yordamida turli ma'lumotlarning sodda va yaqqol ifodalanishi va ularni bajarishga misollar keltiramiz:

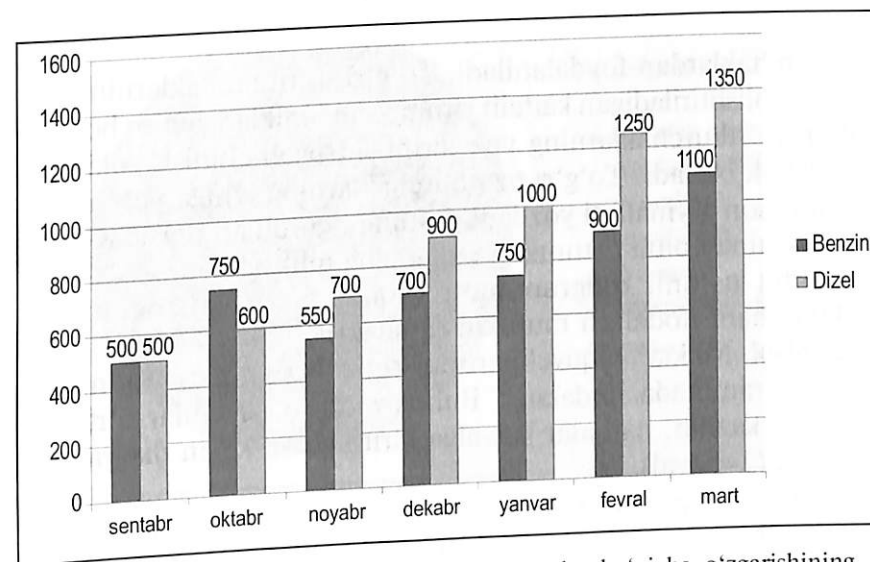
**1-misol.** Fermer xo'jaligining sentabr oyidan mart oyigacha bo'lgan davrda dizel yoqilg'isi va benzin olish bo'yicha tovar birjasi bilan tuzgan shartnomalarining o'zgarish grafigini tuzing (1-jadval).

Ushbu topshiriq yechimining uchta variantini keltiramiz.

Yaqqollikni ta'minlash maqsadida ustunli diagrammalardan ham foydalanish mumkin. Ularni bajarishda eni bir xil bo'lgan to'g'ri



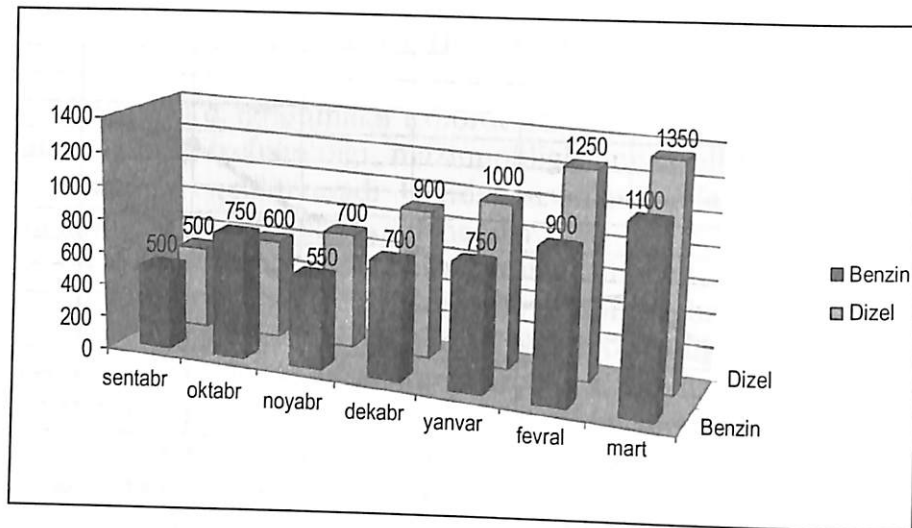
1-shakl. Transport yoqilg'isi iste'molining oylar bo'yicha o'zgarish grafigi.



2-shakl. Transport yoqilg'isi iste'molining oylar bo'yicha o'zgarishining ustunli diagramma shaklida tasvirlanishi.

1-jadval

| Yoqilg'i turi | sentabr | oktabr | noyabr | dekabr | yanvar | fevral | mart |
|---------------|---------|--------|--------|--------|--------|--------|------|
| Benzin, litr  | 500     | 750    | 550    | 700    | 750    | 900    | 1100 |
| Dizel, litr   | 500     | 600    | 700    | 900    | 1000   | 1250   | 1350 |



3-shakl. Transport yoqilg'isi iste'molining oylar bo'yicha o'zgarishining gistogramma (ustunli diagramma) shaklida tasvirlanishi.

to'rtburchaklardan foydalaniladi. To'g'ri to'rtburchaklarning ba-landligi solishtiriladigan kattaliklarning son birliklariga mos bo'ladi. To'g'ri to'rtburchaklarning yuzalarini shtrixlab chiqish yoki bo'yash kerak bo'ladi. To'g'ri to'rtburchaklarning ichiga yoki ustiga ularning son qiymatlari yoziladi. Ustunlar guruhlari orasidagi masofa taxminan bitta ustunning eniga teng qilib olinadi.

Ushbu ustunli diagrammani yaqqol tasvir (gistogramma) shaklida ham ifodalash mumkin (3-shakl).

**2-misol.** Maktab o'quvchilarining sutkalik vaqt taqsimotini sektorli diagrammada ifodalang. Bunda oldin o'quvchilar o'rtasida so'rov o'tkazilib, natijalar jadvalga kiritiladi va keyin diagramma chiziladi (2-jadval).

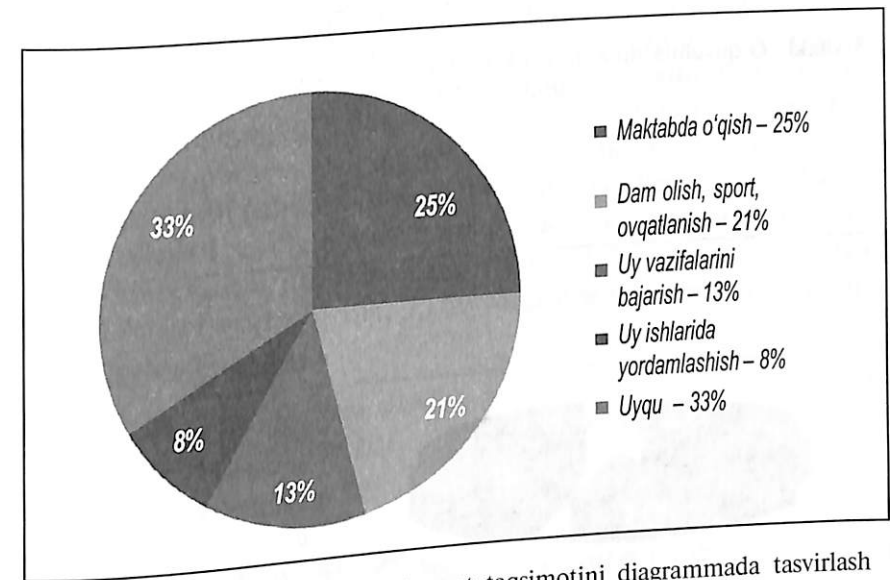
Topshiriqni har bir o'quvchi individual ravishda, o'z kun tartibi misolida bajarib, natijalarni solishtirishi ham mumkin.

Sutka davomida har xil mashg'ulotlarga sarflaydigan vaqtingizni hisoblang. Hisoblangan kattaliklarga asosan jadvalni to'ldiring va shu jadvaldan foydalanib sektorli diagramma chizing (topshiriqni bajarish namunasi 2-jadvalda va 4-6-shakllarda keltirilgan).

**Grafik va diagrammalarni mavzuli chizma va rasm bilan badiiy bezash usullari.** Grafik va diagrammalar kundalik turmush soha-larida ham keng qo'llanilmoqda. Kishilarning dam olish joylari, jamoat transporti, gazeta va jurnallardagi ishlab chiqarish sohasi

Sutka davomida har xil mashg'ulotlarga sarflanadigan vaqt taqsimoti jadvali

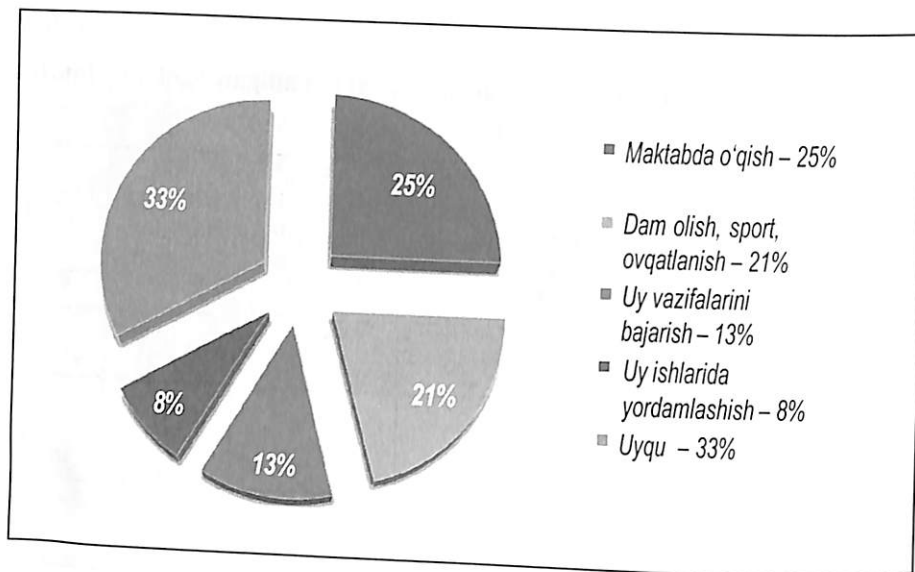
| Mashg'ulot turi                                      | Mak-tabda o'qish | Dam olish, sport, ovqatlanish | Uy vazifalarini bajarish | Uy ishlariga yordam-lashish | Uyqu |
|------------------------------------------------------|------------------|-------------------------------|--------------------------|-----------------------------|------|
| Vaqt, soatda                                         | 6                | 5                             | 3                        | 2                           | 8    |
| Vaqt % da, $r\%$ (24 soat = 100 %)                   | 25               | 21                            | 12,5                     | 8,2                         | 33,3 |
| Diagrammadagi burchak kattaligi (100% = 360) = $r\%$ | 90               | 75                            | 45                       | 120                         | 30   |



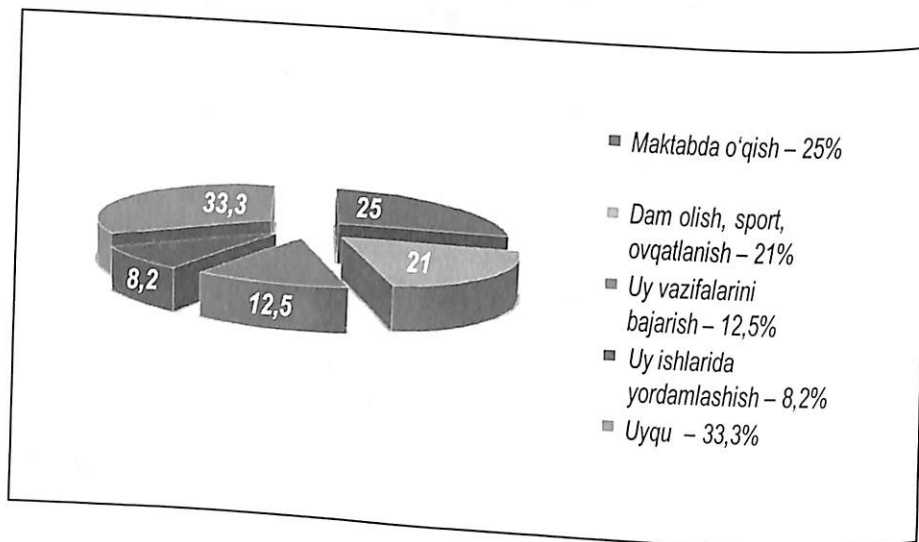
4-shakl. O'quvchilarning sutkalik vaqt taqsimotini diagrammada tasvirlash usullari (1-variant).

yoki korxonalar faoliyati rivojlanishi yoki o'sishini reklama qilishda grafik va diagrammalar maqsadni lo'nda va aniq ifodalash uchun xizmat qiladi.

Reklama maqsadida tayyorlanadigan grafik va diagrammalar o'quv va ilmiy adabiyotlardagi grafik va diagrammalardan o'zining ta'sirchanligi bilan farqlanadi. O'quv va ilmiy adabiyotlarda keltiriladigan grafik va diagrammalar faqat o'rganilayotgan jarayon



5-shakl. O'quvchilarning sutkalik vaqt taqsimotini diagrammada tasvirlash usullari (2-variant).



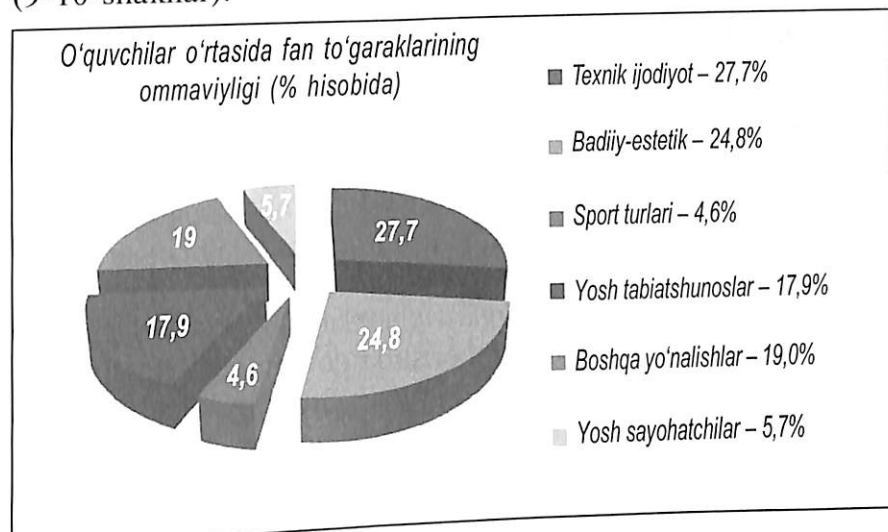
6-shakl. O'quvchilarning sutkalik vaqt taqsimotini diagrammada tasvirlash usullari (3-variant).

yoki qonuniyatdagi kattaliklar o'rtasidagi bog'lanishlarni ochib berishga xizmat qiladi. Ularda mavzuga aloqasi bo'lmagan, o'quvchining diqqatini chalg'itadigan hech qanday ortiqcha grafik tasvir yoki yozuv bo'lmashligi kerak.

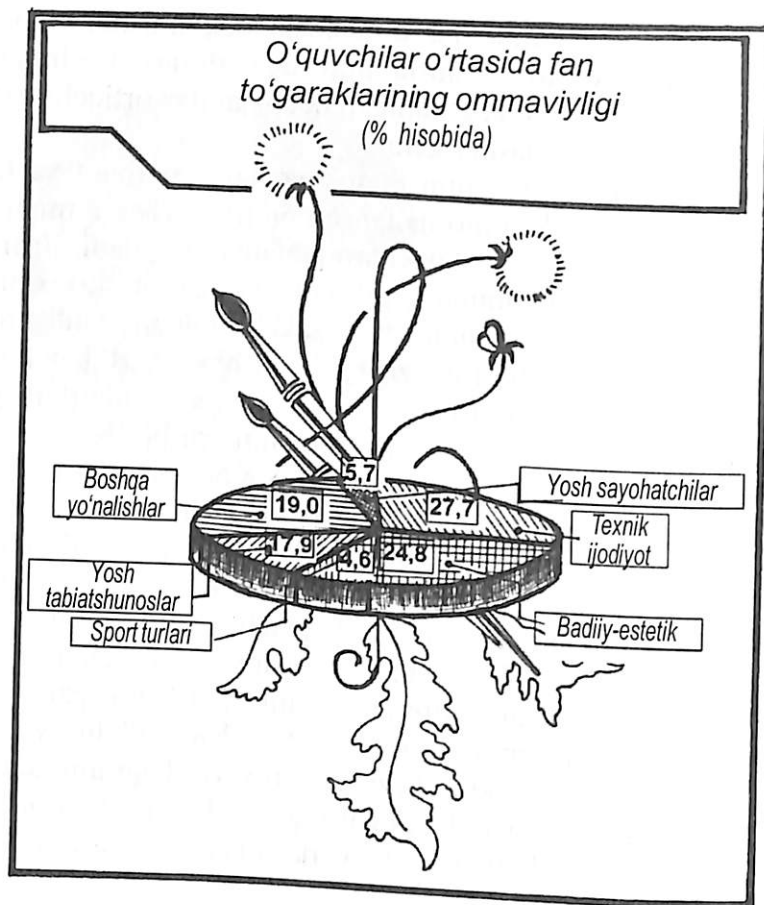
Reklama maqsadlari uchun jamoat joylari, matbuot va televideniya foydalanishga mo'ljallangan grafik va diagrammalarni tayyorlashga birmuncha boshqacharoq talablar qo'yiladi. Birinchi navbatda, ular to'plagan ommaviy axborot vositalari orasida o'zining grafik yechimi, ranglar uyg'unligi va bezaklarining originalligi bilan ajralib turib, kishilar e'tiborini o'ziga jalb qilishi kerak. Ikkinchidan, unda uzatilayotgan axborot hajmi (ma'lumot) keragidan ortiqcha bo'lmashdan, sodda va hamma uchun tushunarli bo'lishi zarur.

Ushbu talablarni bajarish uchun, avvalambor, kishilarni qiziqitiradigan, shu kun uchun dolzarb bo'lgan mavzu tanlanib, o'zaro bog'liq bo'lgan statistik ma'lumotlar olinadi. Olingan ma'lumotlar asosida grafik va diagrammalar bajarilib, orqa fon uchun axborot mazmunini ochib beradigan grafik tasvir (fotomontaj, rasm, chizma, ...) bajariladi. 7-14-shakllarda ommabop mazmunlarda tayyorlangan grafik va diagrammalarga misollar keltirilgan.

Ta'lim tizimi (umumta'lim maktablari, akademik litsey, kasb-hunar kollejlari, ...)da badiiy bezakli grafik va diagrammalardan o'quv kabinetlarini jihozlash, devoriy gazetalardagi maqolalarga grafik ilovalar (rasm, chizma, ...) tayyorlashda foydalanish mumkin (9-10-shakllar).



7-shakl. An'anaviy usulda bajarilgan sektorli diagrammaga misol.

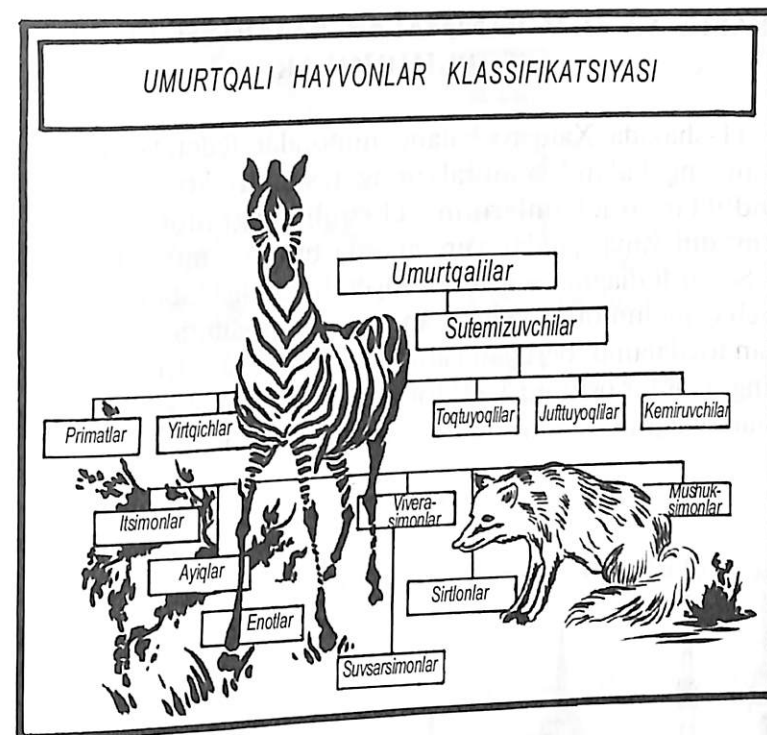


8-shakl. Badiiy bezash yordamida bajarilgan sektorli diagrammaga misol.

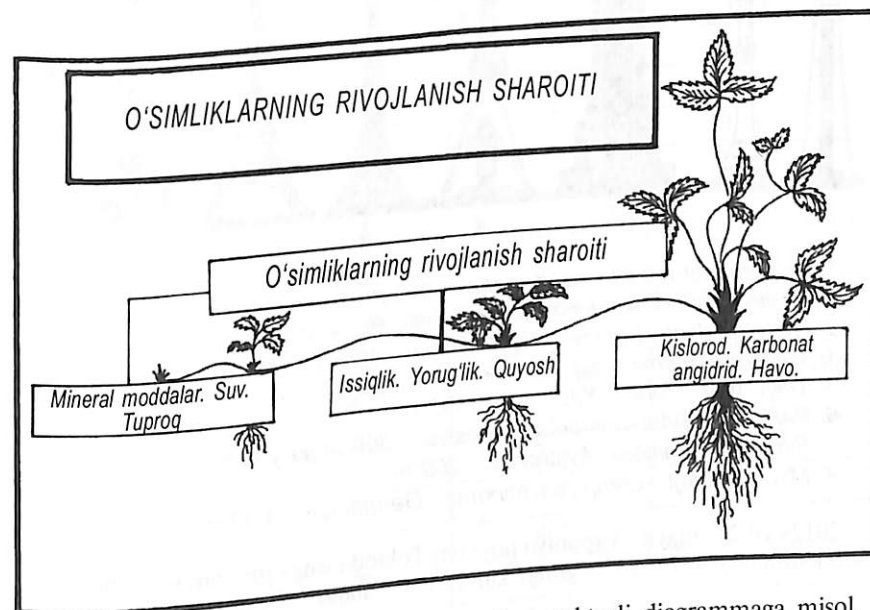
Ustunli va sektorli diagrammalar ko'pincha ma'lum bo'lgan biror statistik ma'lumotni ifodalashda xizmat qiladi.

Bunday diagrammalardan ijtimoiy sohalar bilan bog'liq fanlarni o'rganishda ko'p ishlatiladigan ma'lumotlarni eslab qolish uchun foydalaniladi.

Chiziqli grafiklar odatda o'zgaruvchan kattaliklar orasidagi bog'lanish va qonuniyatlarni ochib berishda qo'llaniladi. Bu grafiklar aniq fanlar (matematika, fizika, kimyo, ...)ni o'rganishda muhim o'rin tutishi bilan birgalikda, biror davr mobaynida kattalikning tashqi, iqtisodiy va ijtimoiy ta'sirlarga bog'liq aniq qonuniyatlarsiz o'zgarishini ifodalashda ham keng qo'llaniladi (mamlakat aholi sonining o'sishi aholining biror mahsulotga bo'lgan talabining ortib yoki kamayib borishi, ...).



9-shakl. Badiiy bezash yordamida bajarilgan sektorli diagrammaga misol.



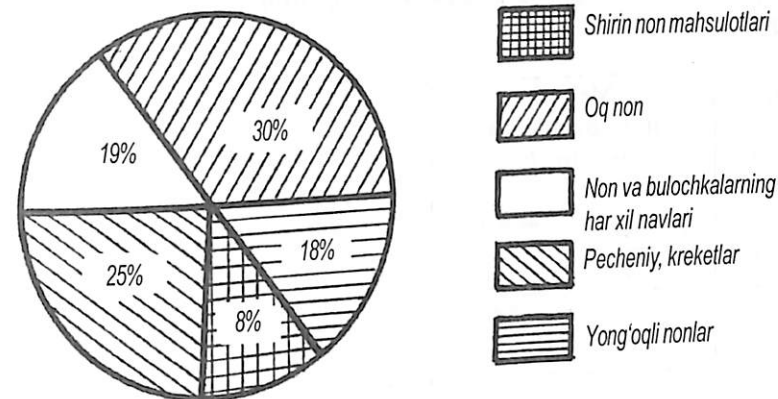
10-shakl. Badiiy bezash yordamida bajarilgan sektorli diagrammaga misol.



## GRAFIK VA DIAGRAMMALAR BAJARISH BO'YICHA TOPSHIRIQLAR

1. 11-shaklda Xalqaro baland minoralar federatsiyasi a'zolari bo'lgan eng baland minoralarning tasvirlari ko'rsatilgan. Ular balandliklari o'lchamlarining chiziqli diagrammasini yasang. Topshiriqni yana qanday variantlarda bajarish mumkin?

2. Sektorli diagrammada novvoychilik mahsulotlarining savdosi bo'yicha ma'lumotlar keltirilgan. Sektorli diagramma ma'lumotlaridan foydalanib, berilgan kattaliklar bo'yicha ustunli diagramma chizing. Har bir ustunni 1-sektor uchun chizib ko'rsatilgan ustunga o'xshatib hajmli ko'rinishda tasvirlang (12-shakl).



12-shakl. Novvoychilik mahsulotlarining savdosi diagrammasi.

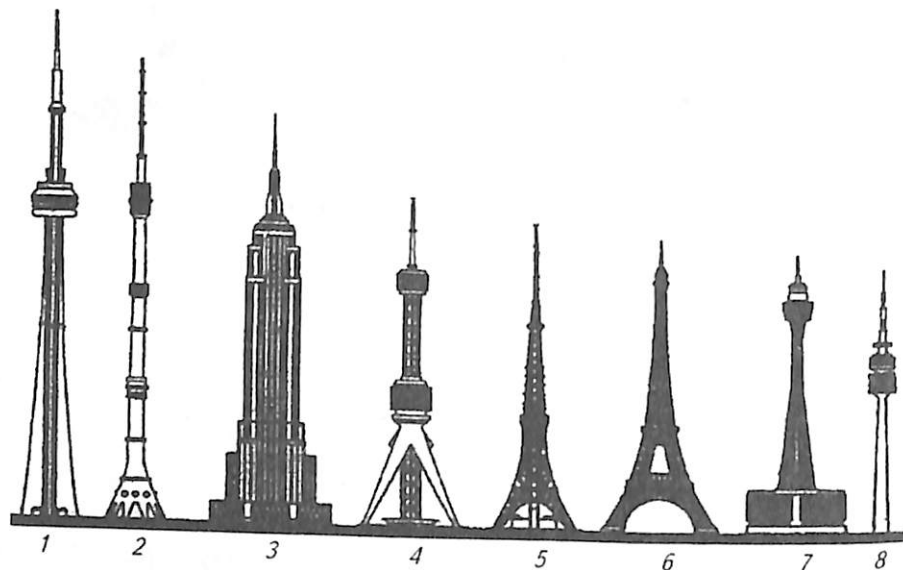
Quyidagi ma'lumotlardan foydalanib grafik va chiziqli diagrammalar bajaring:

1. Tuproq namligining makkajo'xori hosildorligiga ta'siri.

| Tuproq namligi, % | O'simlikning o'rtacha balandligi, sm | Barglarining yuzasi, sm <sup>2</sup> |
|-------------------|--------------------------------------|--------------------------------------|
| 40                | 90                                   | 664                                  |
| 60                | 112                                  | 1270                                 |
| 80                | 118                                  | 2256                                 |
| 100               | 108                                  | 1589                                 |

2. Turli mineral o'g'itlarning o'simliklarning o'sishiga ta'siri.

| Kunlar soni | O'simliklarning ishlatiladigan o'g'itga bog'liq holda o'sishi, sm |            |                  |
|-------------|-------------------------------------------------------------------|------------|------------------|
|             | Kaliyli o'g'itlar                                                 | Fosfat uni | Azotli o'g'itlar |
| 1           | 1                                                                 | 1          | 1                |
| 5           | 2,2                                                               | 2,5        | 2,7              |
| 10          | 5,0                                                               | 6,2        | 7,2              |
| 15          | 6,1                                                               | 8,3        | 9,2              |
| 20          | 6,9                                                               | 10,7       | 12,4             |
| 25          | 7,2                                                               | 14,5       | 16,0             |



1. Torontodagi teleminora, Kanada – 553 m.
2. Moskvadagi «Ostankino» teleminorasi, Rossiya – 540 m.
3. Nyu-Yorkdagi «Empayer steyt bilding», AQSH – 443 m.
4. Toshkent teleminorasi, O'zbekiston – 375 m.
5. Tokio teleminorasi, Yaponiya – 333 m.
6. Parijdagi «Eyfel» minorasi, Fransiya – 300 m.ga yaqin.
7. Sidneydagi minora, Avstraliya – 309 m.
8. Myunxendagi «Olimpiya» minorasi, Germaniya – 290 m.

2012- yil 22- mayda Yaponiya poytaxti Tokioda ishga tushgan «Osmon daraxti» teleminorasi (634 m) bugungi kunda eng baland teleminora hisoblanadi.

11-shakl. Eng baland minoralarning tasvirlari.

3. Ishlab chiqarish korxonasidagi mehnat unumdorligining 2006-yilga nisbatan o'sishi.

| Yillar | Mehnat unumdorligining o'sishi, % |        | Yillar | Mehnat unumdorligining o'sishi, % |        |
|--------|-----------------------------------|--------|--------|-----------------------------------|--------|
|        | reja bo'yicha                     | amalda |        | reja bo'yicha                     | amalda |
| 2007   | 112                               | 116    | 2010   | 137,7                             | 138,1  |
| 2008   | 120,0                             | 125    | 2011   | 141,0                             | 142,2  |
| 2009   | 126,6                             | 127,4  | 2012   | 143,2                             | 150,5  |

4. Do'konlarda sut va go'shtning 2006-yilga nisbatan sotilish miqdorining o'zgarishi.

| Yillar | Mahsulotlarning 2006-yilga nisbatan sotilishi, % |        | Yillar | Mahsulotlarning 2006-yilga nisbatan sotilishi, % |        |
|--------|--------------------------------------------------|--------|--------|--------------------------------------------------|--------|
|        | sut                                              | go'sht |        | sut                                              | go'sht |
| 2007   | 102                                              | 101,5  | 2010   | 109,2                                            | 105,7  |
| 2008   | 104                                              | 103    | 2011   | 111,8                                            | 108,2  |
| 2009   | 109                                              | 103,7  | 2012   | 115,6                                            | 109,2  |

5. Ko'chat o'tqazish tajribalarining natijalari.

| Kunlar soni | Ko'chatning balandligi, sm |           | Kunlar soni | Ko'chatning balandligi, sm |           |
|-------------|----------------------------|-----------|-------------|----------------------------|-----------|
|             | 1-tajriba                  | 2-tajriba |             | 1-tajriba                  | 2-tajriba |
| 5           | 3                          | 2,5       | 13          | 10                         | 11,7      |
| 7           | 5,6                        | 4,5       | 15          | 12                         | 13,8      |
| 9           | 6,5                        | 7         | 17          | 12,5                       | 14        |
| 11          | 8                          | 8,5       |             |                            |           |

Quyidagi ma'lumotlardan foydalanib ustunli diagrammalarni yasang.

1. Qishloq xo'jaligiga mineral o'g'itlarning yetkazib berilishi.

| Yil  | O'g'itlar, mln. t |
|------|-------------------|
| 1995 | 0,8               |
| 2000 | 1,27              |
| 2005 | 1,85              |
| 2010 | 2,58              |

2. Hudud qishloq xo'jaligida elektr energiyasi iste'moli o'zgarishi.

| Yil  | Elektr energiyasi, mln kVt/s |
|------|------------------------------|
| 2002 | 56,8                         |
| 2007 | 71,2                         |
| 2012 | 78,5                         |

3. Ayrim kimyoviy elementlarning atom og'irliklari.

| Kimyoviy element | Atom og'irligi |
|------------------|----------------|
| Litiy            | 7              |
| Natriy           | 28             |
| Kaliy            | 39             |
| Rubidiy          | 86             |
| Seziy            | 133            |
| Magniy           | 24             |
| Bariy            | 137            |
| Aluminiy         | 27             |
| Mis              | 64             |

4. Insonning turli faoliyatlarda energiya sarflash miqdori.

| Faoliyat turi         | Energiya miqdori, kg ga kkal/s |
|-----------------------|--------------------------------|
| Uyqu                  | 0,93                           |
| O'qish                | 1,5                            |
| Uy ishlari            | 3,0                            |
| Piyoda yurish         | 3,2                            |
| Tekis yo'lda yugurish | 6,0                            |
| Eshkak eshish         | 6,0                            |
| Velosiped haydash     | 8,0                            |
| Avtomashina haydash   | 1,5                            |

### 5. 100 g mahsulotdagi oqsillar miqdori.

|                 |      |
|-----------------|------|
| Go'sht .....    | 20,0 |
| Baliq .....     | 16,0 |
| Tuxum .....     | 10,6 |
| Pishloq .....   | 30,0 |
| Sut .....       | 3,0  |
| Non .....       | 8,0  |
| Kartoshka ..... | 1,7  |
| Soya .....      | 34,0 |
| No'xat .....    | 19,7 |

### Berilgan ma'lumotlardan foydalanib sektorli diagramma quring.

Agar kattaliklar foizlarda keltirilmagan bo'lsa, hamma kattaliklarning yig'indisi 100% ga teng deb qabul qilinadi va tarkibiy qismlar foizlarda hisoblab chiqiladi. Sektorli diagrammani bajarish uchun 360° ni 100% ga teng deb qabul qilinadi hamda tarkibiy qismlari foizlariga mos ravishda graduslarda o'lchab qo'yiladi.

### 1. Havoning foizlardagi hajmiy tarkibi:

|                |       |                         |      |
|----------------|-------|-------------------------|------|
| Azot .....     | 78,68 | Karbonat angidrid ..... | 0,35 |
| Kislorod ..... | 20,90 | Boshqa gazlar .....     | 0,07 |

### 2. Kutubxonaga a'zo kitobxonlarning yoshlari bo'yicha tarkibi.

Yoshi, yillarda                      Kitobxonlar soni, kishi

|                    |    |
|--------------------|----|
| 15-20 .....        | 12 |
| 21-30 .....        | 20 |
| 31-40 .....        | 24 |
| 41-50 .....        | 21 |
| 51-60 .....        | 13 |
| 60 dan katta ..... | 10 |

### 3. Qattiq qotishmalarning tarkibi.

| Qotishma  | Tarkibiy qismlari, % larda |       |         |          |         |       |
|-----------|----------------------------|-------|---------|----------|---------|-------|
|           | Xrom                       | Nikel | Kremniy | Marganes | Uglerod | Temir |
| Sormayt 1 | 31                         | 4,1   | 3,8     | 1,5      | 2,5     | 57    |
| Sormayt 2 | 17                         | 2,5   | 2,5     | 1,0      | 2,0     | 75    |

### 4. Sanoat mahsulotlarining turlari bo'yicha iste'mol qilinishi.

| Sanoat turi      | Umumiy mahsulotga nisbatan, % |
|------------------|-------------------------------|
| Yengil .....     | 27,9                          |
| Oziq-ovqat ..... | 47,0                          |
| Og'ir .....      | 25,1                          |

### 5. Fabrikadagi ishlab chiqarish bilan band xodimlar tarkibi (kishi).

|                             |    |
|-----------------------------|----|
| Ishchilar .....             | 78 |
| Shogirdlar .....            | 2  |
| Muhandis va texniklar ..... | 12 |
| Xizmatchilar .....          | 4  |

## IJODIY TOPSHIRIQLAR

Quyidagi jadvallarda geografik bilimlar bilan bog'liq bo'lgan turli xil statistik ma'lumotlar keltirilgan. Shu ma'lumotlarni o'zida to'liq yoki qisman aks ettiradigan, o'quvchi e'tiborini o'ziga jalb qiladigan badiiy bezakli grafik yoki diagrammalarni bajaring.

### 1. Okeanlar

| Okean nomi   | Yuzasi, mln km <sup>2</sup> | O'rtacha chuqurligi, m | Eng chuqur joyi, m | Hajmi, mln km <sup>3</sup> |
|--------------|-----------------------------|------------------------|--------------------|----------------------------|
| Atlantika    | 91,66                       | 3597                   | 8742               | 329,7                      |
| Hind         | 76,17                       | 3710                   | 7729               | 282,7                      |
| Tinch        | 178,68                      | 3976                   | 11022              | 710,4                      |
| Shimoliy Muz | 14,75                       | 1225                   | 5527               | 18,1                       |

Yer sharidagi eng yirik daryolar, orollar, eng baland tog'cho'qqilari, eng katta sahrolar va eng baland harakatdagi vulqonlarning xarakteristikalaridan foydalanib grafik yoki diagrammalar bajaring.



## 2. Eng yirik daryolar

| Daryoning nomi            | Uzunligi, km | Havzasining maydoni, ming km <sup>2</sup> | O'rtacha suv sarfi, m <sup>3</sup> /s |
|---------------------------|--------------|-------------------------------------------|---------------------------------------|
| Nil (Kagera bilan)        | 6671         | 2870                                      | 26 000                                |
| Missisipi (Missuri bilan) | 6420         | 3268                                      | 19 000                                |
| Amazonka (Maranon bilan)  | 6400         | 7180                                      | 220 000                               |
| Yanszi                    | 5800         | 1808                                      | 34 000                                |
| Ob (Irtish bilan)         | 5410         | 2990                                      | 12 700                                |

## 3. Eng yirik orollar

| Orolning nomi | Yuzasi, ming km <sup>2</sup> | Joylashgan okeani |
|---------------|------------------------------|-------------------|
| Grenlandiya   | 2176                         | Shimoliy Muz      |
| Yangi Gvineya | 829                          | Tinch             |
| Kalimantan    | 734                          | Hind              |
| Madagaskar    | 590                          | Hind              |
| Baffin yeri   | 476                          | Shimoliy Muz      |

## 4. Yer yuzidagi eng baland tog' cho'qqilari

| Joylashgan qit'asi | Nomi                          | Balandligi, m | Tog' massivi   |
|--------------------|-------------------------------|---------------|----------------|
| Osiyo              | Jomolungma                    | 8848          | Himoloy        |
| Janubiy Amerika    | Akonkagua                     | 6962          | And            |
| Shimoliy Amerika   | Mak-Kinli                     | 6194          | Alaska tizmasi |
| Afrika             | Kilimanjaro (Uxuru cho'qqisi) | 5895          | Kilimanjaro    |
| Yevropa            | Elbrus                        | 5642          | Kavkaz         |

## 5. Eng baland harakatdagi vulqonlar

| Joylashgan qit'asi | Nomi         | Joylashgan o'rni | Balandligi, m |
|--------------------|--------------|------------------|---------------|
| Janubiy Amerika    | Lyulyaylyako | Chili-Argentina  | 6723          |
|                    | San-Pedro    | Chili            | 6154          |
|                    | Antofalya    | Argentina        | 6100          |
| Shimoliy Amerika   | Orisaba      | Meksika          | 5700          |
| Osiyo              | Demavend     | Eron             | 5604          |

## 6. Eng katta sahro va cho'llar

| T.r. | Nomi          | Joylashgan o'rni                                       | Taxminiy maydoni, km <sup>2</sup> |
|------|---------------|--------------------------------------------------------|-----------------------------------|
| 1    | Sahroyi Kabir | Shimoliy Afrika                                        | 7 mln. dan ortiq                  |
| 2    | Gobi          | Markaziy Osiyo, Mongoliya va Xitoy                     | 2 mln.                            |
| 3    | Liviya        | Shimoliy Afrika, Nil daryosining quyi oqimidan g'arbda | 2 mln.                            |
| 4    | Alashan       | Markaziy Osiyo, Xitoyning shimoliy qismi               | 1 mln.                            |
| 5    | Qoraqum       | Markaziy Osiyo, Turkmaniston                           | 350 ming                          |
| 6    | Qizilqum      | Markaziy Osiyo, O'zbekiston va Qozog'iston             | 300 ming                          |

## XALQ AMALIY SAN'ATIDA AMALIY GRAFIKANING QO'LLANILISHI

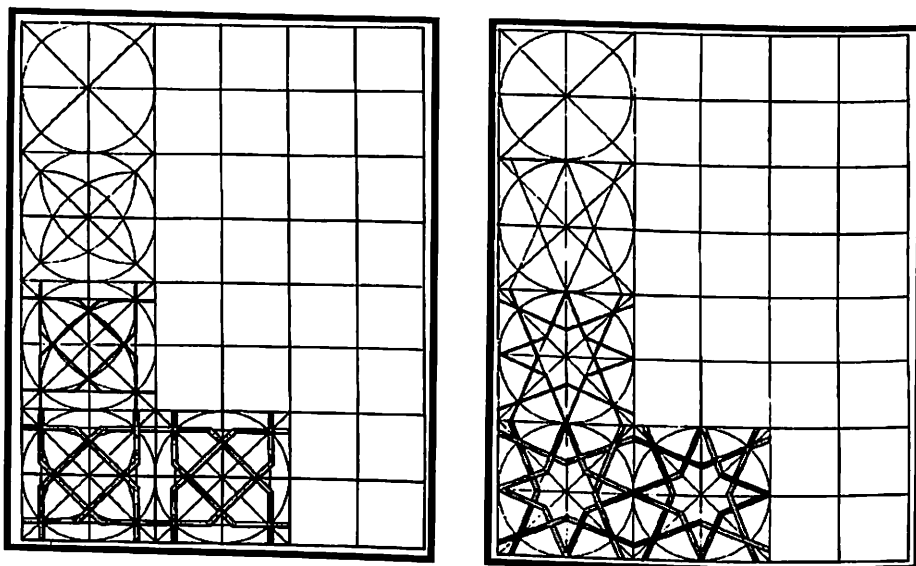
Hamma xalqlarning qadimiy naqshlarida to'g'ri ko'pburchaklardan foydalanilgan. Kishilar o'sha zamonlardayoq ularning go'zalligini qadrlashgan. Bundan tashqari, ular tabiatda to'g'ri ko'pburchaklarni ko'plab chiroyli namunalarini ko'rib, ularni o'z faoliyatlarida, badiiy bezash ishlarida qo'llashga intilishgan. Masalan, beshburchakli minerallar, gullar, mevalarning shakllarida va ayrim dengiz hayvonlari (dengiz yulduzi) tuzilishida, oltiburchakni esa asalari uyasida kuzatish mumkin. Bekorga qadimgi davr va hozirgi zamon olimlari va amaliyotchilari to'g'ri ko'pburchaklar bilan qiziqishmagan.

O'zbekiston hududida yashagan xalqlar ham juda qadim zamonlardan oq aylanani teng qismlarga bo'lishning juda aniq usullarini bilishgan. Misol sifatida S.P.Tolstov rahbarligida Qo'yqirilgan qal'ada o'tkazilgan arxeologik qazishmalarda topilgan astronomik o'lchov asbobi gardishini ko'rsatish mumkin. Bundan 2000 yilcha oldin tayyorlangan ushbu diskda aylanani 360 ga bo'luvchi chiziqlarning izlari yaxshi saqlangan.

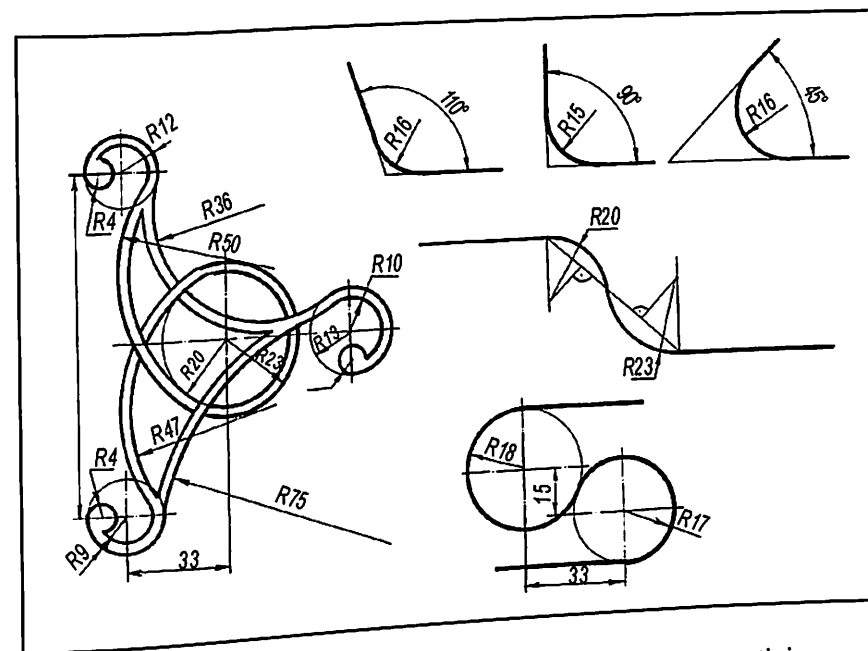
Respublikamiz hududida VIII asrda islom dini keng yoyilib, tasviriy san'at o'ziga xos rivojlanish yo'lini bosib o'tgan. San'at

asarlarida (rasm) jonli mavjudotlarni tasvirlash taqiqlanishi bilan rassomlar, xalq hunarmandlari tomonidan hozirgacha geometrik yasashlar usulida bajarilgan turli naqshlarning juda ko'p turlari yetib kelgan. Bu naqshlar: geometrik naqshlar (girihi — 13-shakl) va o'simliksimon naqshlar (islami — 14-shakl) turlariga bo'linadi. Ikkala turdagi naqshlar ham Sharq xalqlarida keng tarqalgan. Lekin bu naqshlar san'at darajasidagi yuksak ko'rinishga ko'tarilishida qadimgi O'zbekiston hududidagi usta va hunarmandlarning hissasi juda katta bo'lgan. Xiva, Samarqand, Buxoro kabi qadimiy shaharlardagi tarixiy obidalar bezaklarida, hunarmandlar tayyorlagan buyumlarda bu naqshlar saqlanib kelmoqda, ayniqsa, girihlar chiroyliligi va nafisligi bilan hozirgacha tadqiqotchilarni o'ziga jalb qilib kelmoqda. Ayrim murakkab girihlarni bajarish uslublarini aniqlash ham qiyin bo'lgan. Umuman, qadimgi ustalar va hunarmandlar geometrik yasashlarni, aylana va kvadratni teng qismlarga bo'lish, tutashmalarni bajarish usullarini juda yaxshi bilishgan. 13-shaklda O'zbekiston hududidagi tarixiy yodgorliklarda bizgacha yetib kelgan girihlarni bajarish bosqichlari tahlil qilingan.

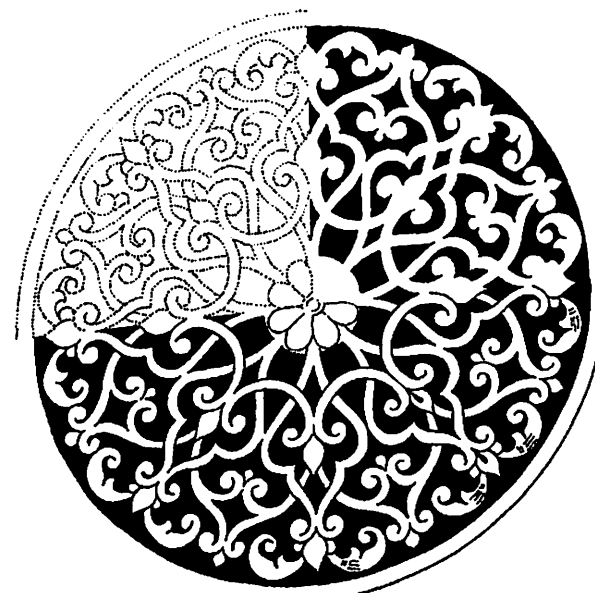
Aylanani teng qismlarga bo'lish va undan amalda foydalanishga doir misollarni ko'plab keltirish mumkin.



13-shakl. Geometrik yasashlar usulida bajarilgan milliy naqshlar.



14-shakl. Tutashmalardan foydalanib islami naqsh elementini bajarishga misol.

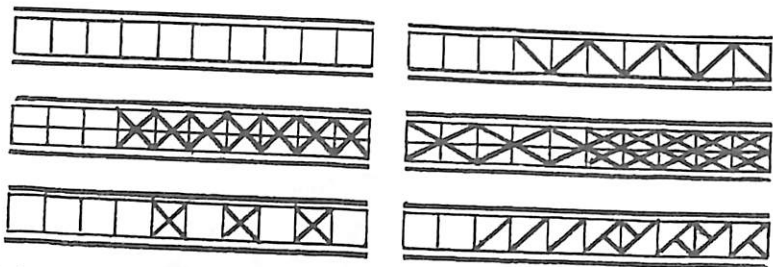


15-shakl. Geometrik yasashlardan foydalanib milliy naqsh «islami»ni bajarishga misol.

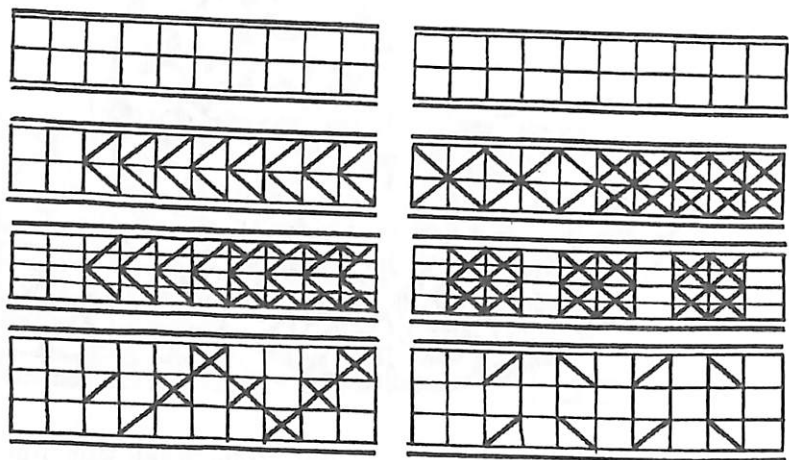
## MILLIY USLUBDA NAQSH KOMPOZITSIYASINI TUZISH BO'YICHA TOPSHIRIQLAR

Qadimda xalq ustalari biror naqshni mahsulotga tushirishdan oldin maxsus qog'ozga uning eskizi (ulgisi)ni chizib olishgan. Girih kompozitsiyalarini tuzishda turli xilda tayyorlangan to'rlardan keng foydalanilgan. Quyidagi topshiriqlarda naqsh bajarish uchun to'rlar namunalari keltirilgan. Topshiriq variantini o'qituvchi ko'rsatmasi yoki o'zingizning qiziqishingiz bo'yicha tanlashingiz mumkin. Ularning ayrimlarida naqsh kompozitsiyasi tuzishning dastlabki bosqichlari ham tasvirlangan. Topshiriqni bajarish uslubini tushunib olgandan keyin boshqa variantlarni yaratish unchalik qiyin emasligiga ishonch hosil qilasiz.

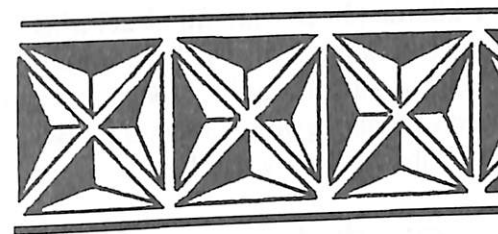
1. Quyidagi shakllarda naqsh kompozitsiyasini tuzish uchun to'rlarning eskizlari keltirilgan. Ulardan foydalanib oddiy naqsh kompozitsiyalarini tuzing. Naqshlarga rang bilan badiiy ishlov berib, vazifani yakunlang.



16-shakl. Oddiy tasmasimon naqsh kompozitsiyasini tuzish uchun to'rlar namunalari.

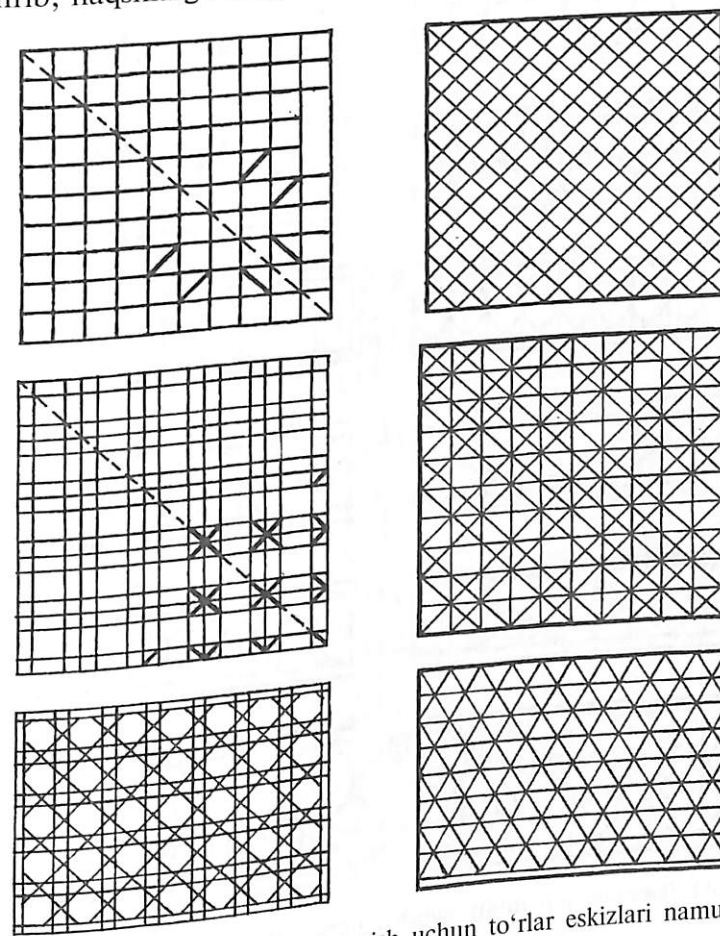


17-shakl. Tasmasimon girih kompozitsiyasini tuzish uchun to'rlar.



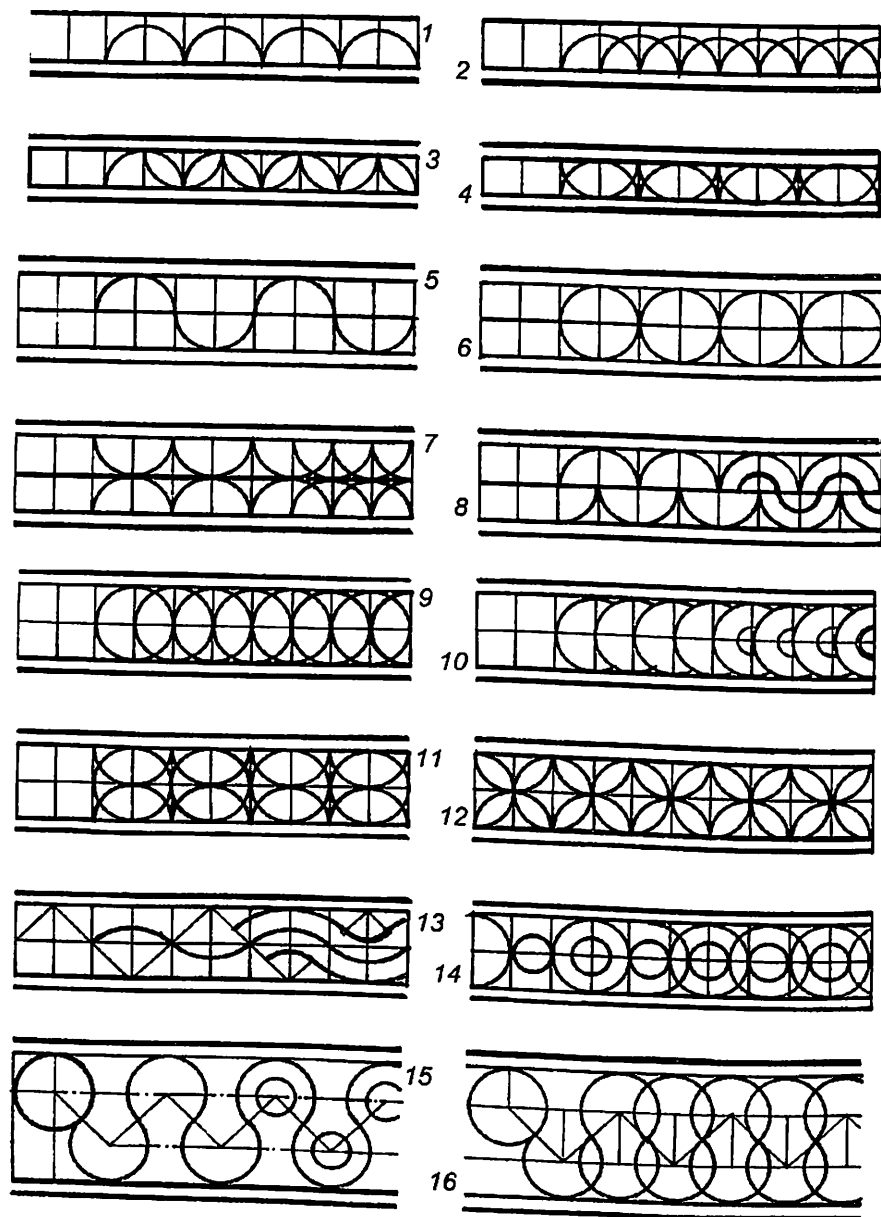
18-shakl. Tasmasimon girih kompozitsiyasining yakunlangan fragmenti.

2. 19-shaklda keltirilgan to'rlar namunalaridan foydalanib, milliy uslubdagi girih kompozitsiyalarini tuzing. Naqshlarni bajarishda 13-shakldagi kabi girih chiziqlarining qat'iy tartibda bir-biriga nisbatan joylashuviga e'tibor bering. Ortiqcha (yasash) chiziqlarini o'chirib, naqshlarga rang bilan ishlov berib, vazifani yakunlang.



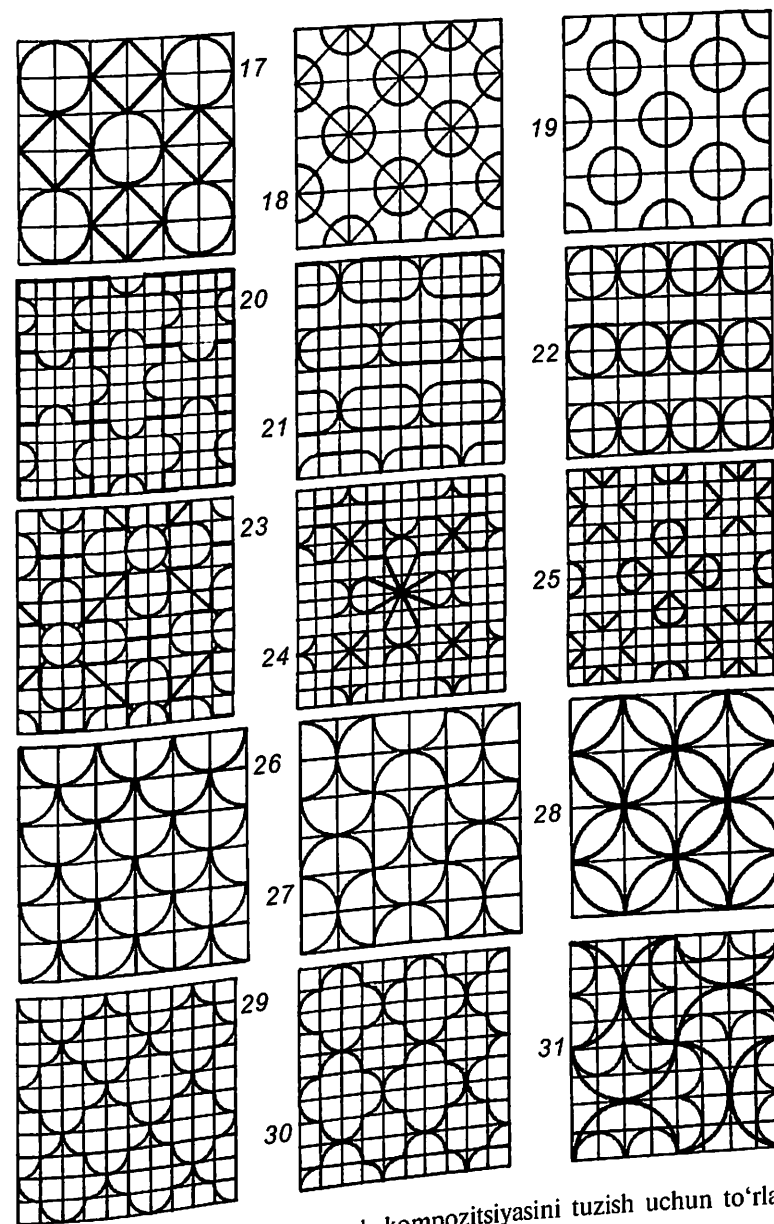
19-shakl. Girih kompozitsiyasini tuzish uchun to'rlar eskizlari namunalari.

3. Quyidagi shakllarda (1–16-variantlar) keltirilgan tasvirlardan foydalanib (20-shakl) sirkul va chizg'ich yordamida tasmasimon milliy naqsh kompozitsiyasini tuzing. Naqsh tasvirini bajarishda chiziqlarning o'zaro vaziyatlariga e'tibor qaring. Bajarilgan tasvirga rang bilan ishlov berib, vazifani yakunlang.



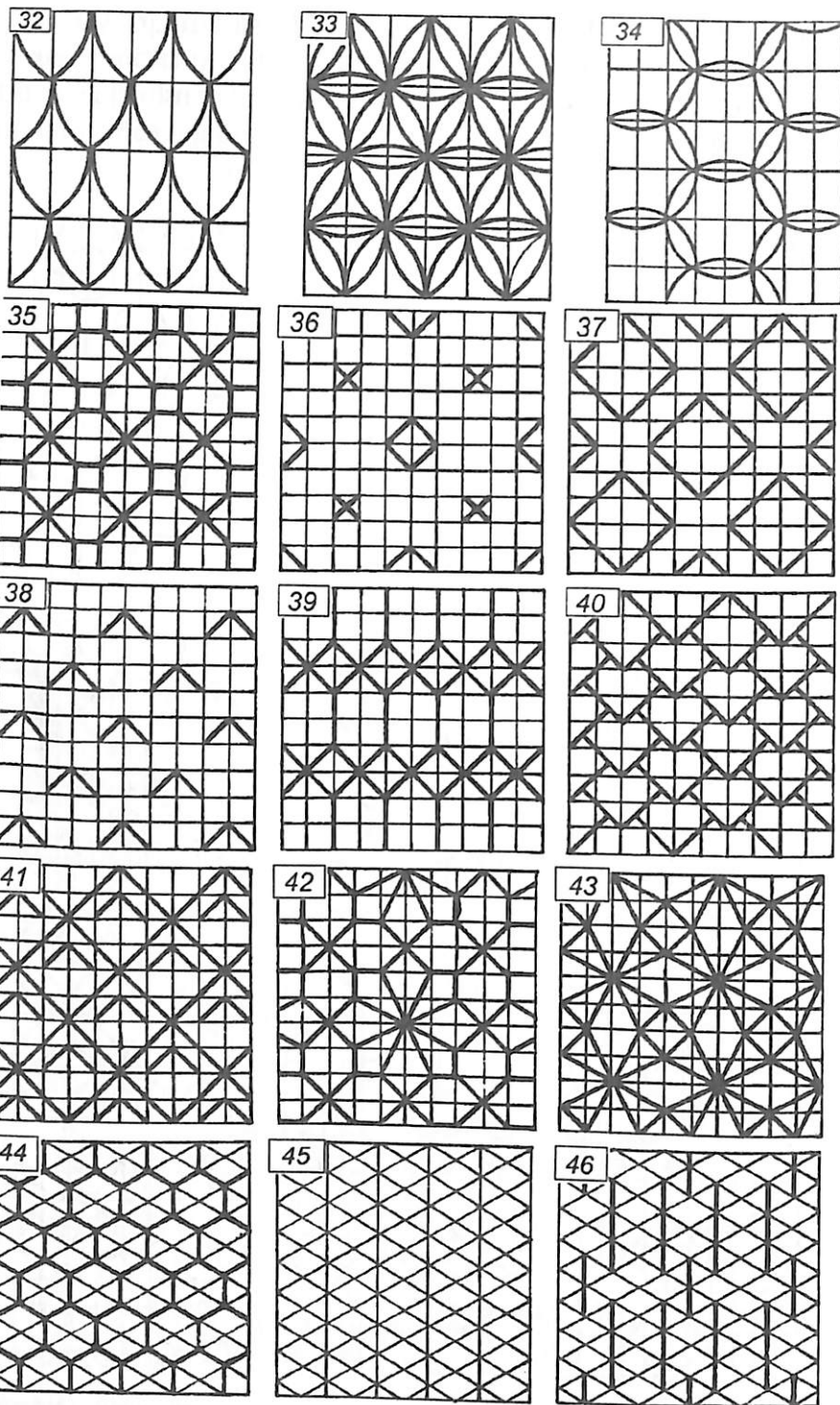
20-shakl. Tasmasimon milliy naqsh kompozitsiyasini tuzish uchun eskizlar namunalari.

4. Quyidagi to'rlarda (21-shakl, 17–46-variantlar) surkul va chizg'ichdan foydalanib naqsh bajarish uchun eskizlarning namunalari keltirilgan. Shu eskizlardan foydalanib milliy uslubdagi naqsh kompozitsiyasini tuzing va oldingi variantlardagi kabi vazifani yakunlang.



21-shakl. Milliy uslubdagi naqsh kompozitsiyasini tuzish uchun to'rlar eskizlari.

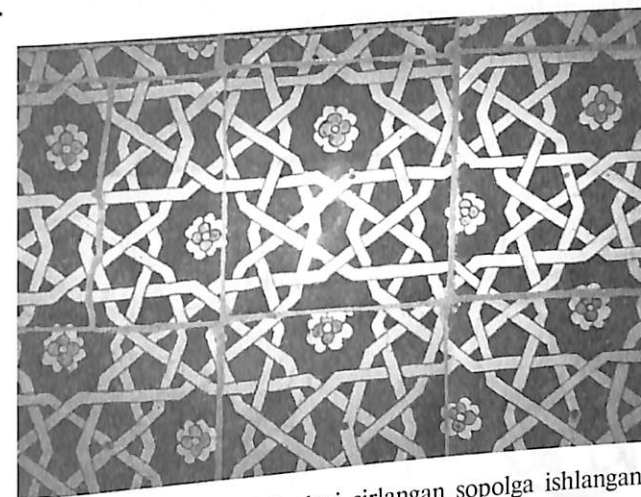




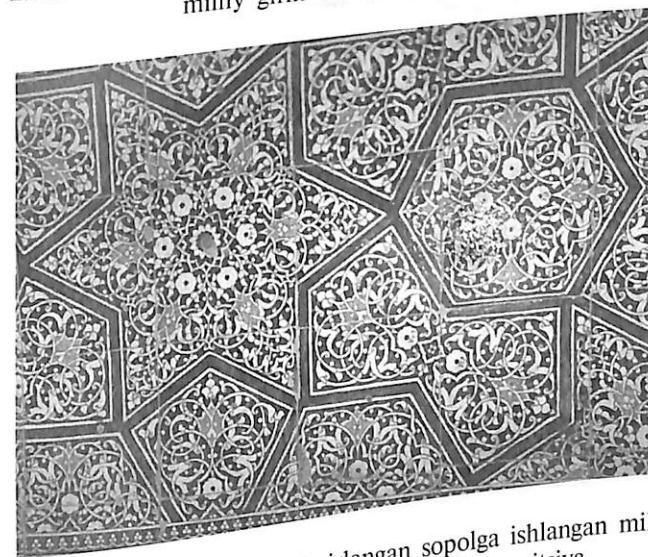
21-saklning davomi.

### Ijodiy topshiriq.

Geometrik yasashlar va tutashmalar mavzularini va keltirilgan ma'lumotlarni o'zlashtirgandan keyin 13-shakldagiga o'xshash «Men tuzgan girih» yoki 15-shakldagi singari «Men tuzgan turunj (rozet)» mavzularida milliy uslubdagi naqsh kompozitsiyalarini tuzing. Topshiriqni bajarishda mamlakatimiz tarixiy obidalaridagi naqsh kompozitsiyalaridan foydalanish tavsiya qilinadi (22–23-shakllarda tarixiy obidalardagi milliy naqshlardan parchalar tasvirlangan).



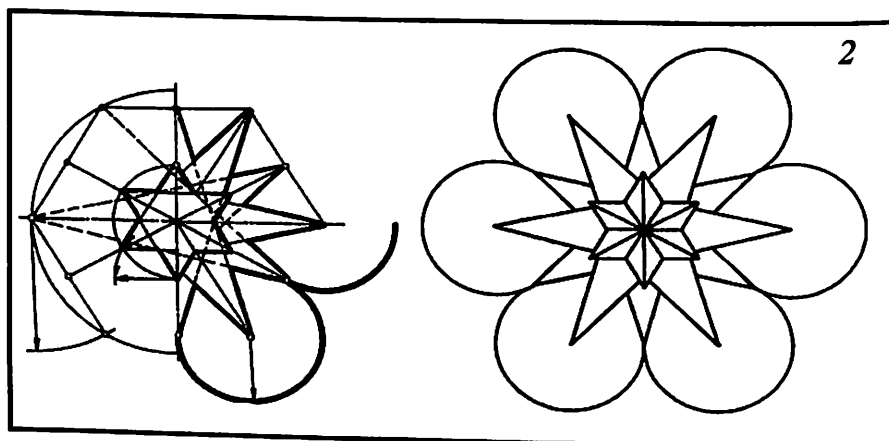
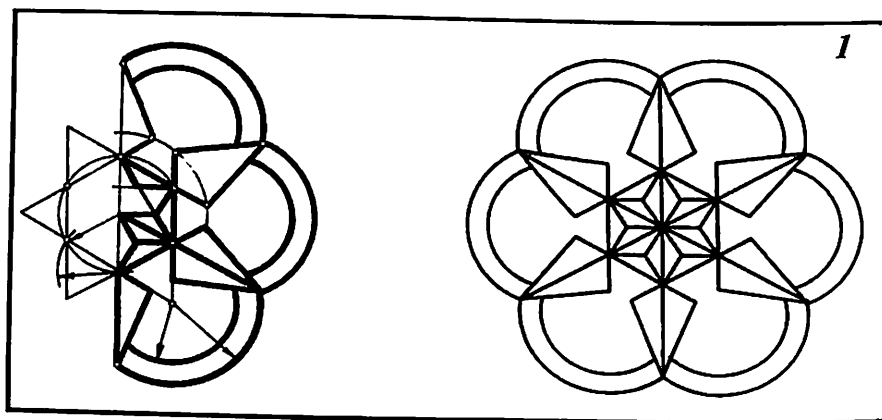
22-shakl. Tarixiy obidalardagi sirlangan sopolga ishlangan milliy girih kompozitsiyasi.



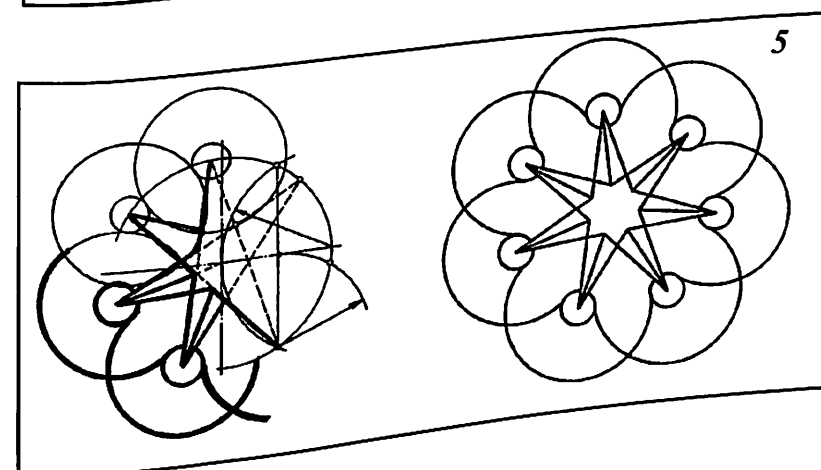
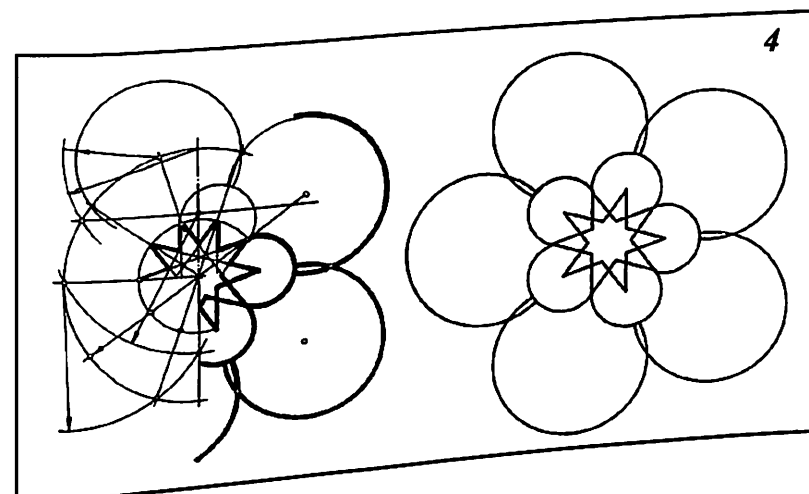
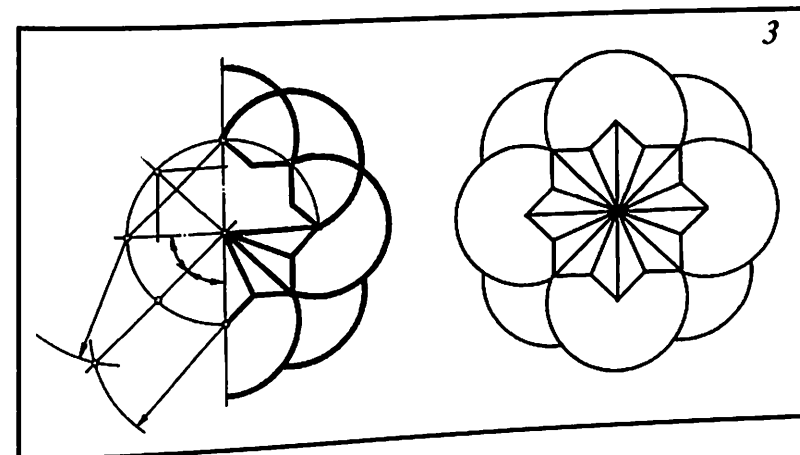
23-shakl. Tarixiy obidalardagi sirlangan sopolga ishlangan milliy girih va islami naqshlardan iborat kompozitsiya.

## «TURUNJ» NAQSHLARINI BAJARISH BO'YICHA IJODIY TOPSHIRIQLAR

Quyidagi shakllarda sirkul va chizg'ichdan foydalanib, oddiy geometrik yasashlar yordamida «giriqli turunj» kompozitsiyasiga namunalar keltirilgan (24-shakl). Turunjni yasash ketma-ketligi shaklning yuqorida joylashgan tasvirlarida ingichka chiziqlar orqali berilgan. Ushbu tasvirlarni zarur kattalikda bajarganingizdan keyin bo'sh joylariga islimi naqshlarini bajarib, rang berishingiz mumkin. Bajirilgan tasvirdan har xil sovg'a buyumlarini tayyorlashda foydalanishingiz mumkin.



24-shakl.



24-shaklning davomi.

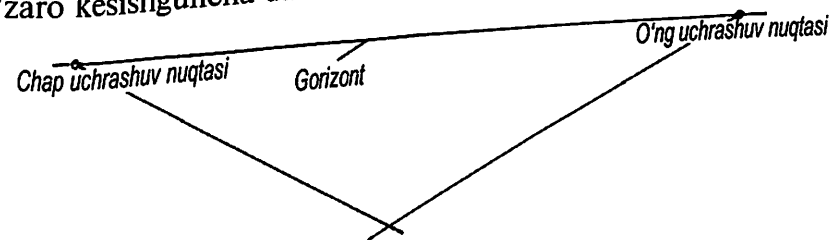
## ARXITEKTURAVIY LOYIHALASH BO'YICHA TOPSHIRIQLAR

Arxitektorlar biror binoni loyihalaganlarida odatda shu bino qurib bitkazilganida qanday ko'rinishga ega bo'lishi va uning kishilarga hissiy ta'sirini aniqlash maqsadida perspektiv tasvirini bajaradilar. Perspektiva yaqqol tasvirning bir ko'rinishi bo'lib, markaziy proyeksiyalash qonunlariga asoslanib bajariladi. Tasviriy san'at darslarida o'rganganlaringizdan ham bilasizki, barcha realistik rasmlar ham perspektiva qonuniyatlariga asosan bajariladi. Shuning uchun ham perspektiva bajarish usullarini egallashning amaliy ahamiyati katta.

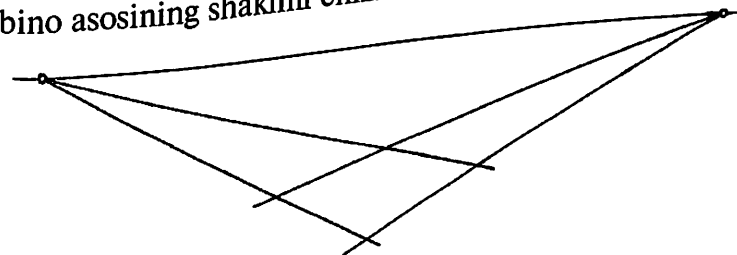
Quyida milliy me'moriy yodgorlikning perspektiv tasvirini soddalashtirib chizish bosqichlarini ko'rib chiqamiz (25-shakl).

Tasvirlanayotgan obyekt turi va xususiyatlariga qarab perspektiv tasvirlar ham turli usullarda bajariladi. Ushbu topshiriqlarda binoning perspektiv tasvirini qo'lda, olchamlari nisbatini ko'z bilan chamalab bajarilishi sababli (rasm chizish jarayonidagi kabi) perspektiva bajarishning sodda usuli — «ikki nuqtali perspektiva» bajarish bosqichlarini ko'rib chiqamiz.

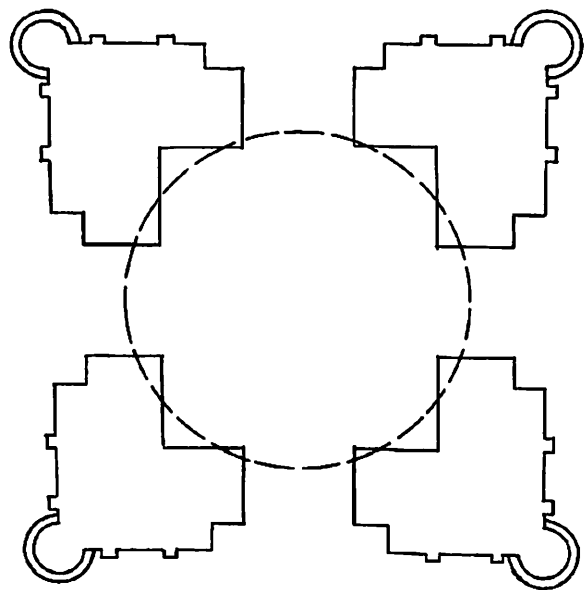
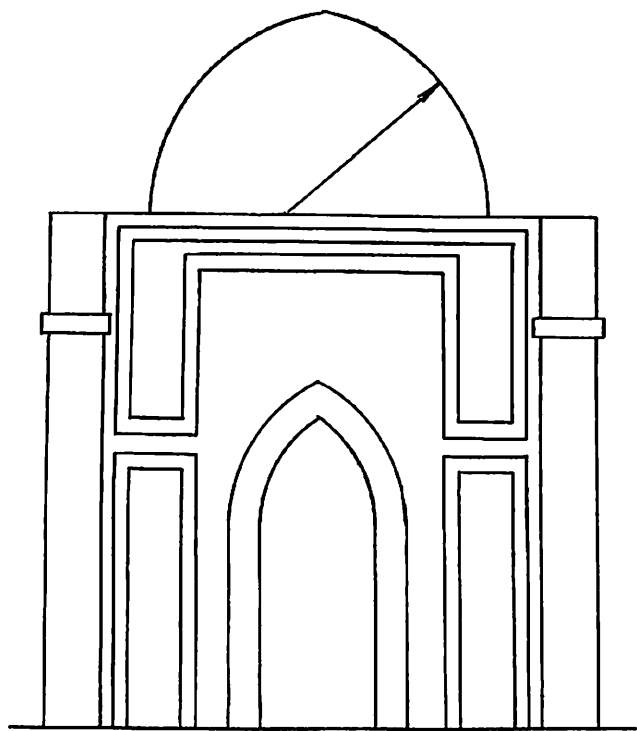
1. Gorizont chizig'ini o'tkazib, unda oralarini keng qilib chap va o'ng uchrashish nuqtalarining o'rni ixtiyoriy belgilang. Uchrashish nuqtalaridan pastga qarab ikkita chiziq o'tkazing va ularni o'zaro kesishguncha davom ettiring.



2. Uchrashish nuqtalarining har biridan ikkinchi chiziqni o'tkazib, bino asosining shaklini chizib oling.

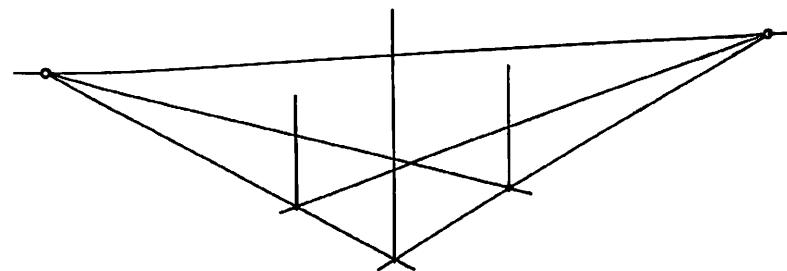


24-shaklning davomi.

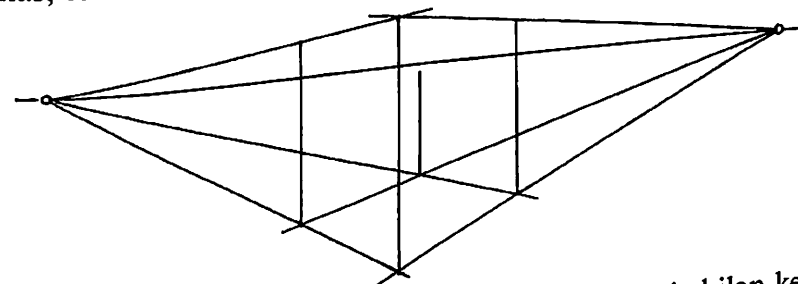


25-shakl. Perspektiv tasvir bajarish misoliga topshiriq varianti.

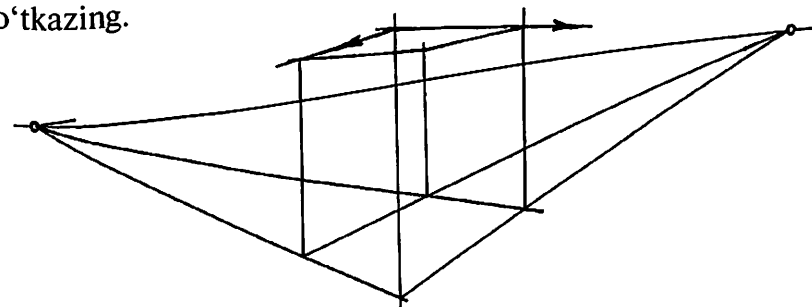
3. O'zingizga yaqin joylashgan uchta kesishish nuqtalaridan vertikal chiziqlar chiqaring. Bu chiziqlar bino qirralarining o'rmini bildiradi.



4. O'zingizga yaqin joylashgan vertikal chiziqda bino devorining balandligini belgilab oling (binoning eni va uzunligiga nisbatini hisobga olgan holda). Shu nuqtadan ikkita uchrashuv nuqtalariga to'g'ri chiziqlar o'tkazing va bino tomining pastki qismi shaklini chizing. Chiziqlarni uchrashuv nuqtalarigacha to'liq o'tkazish shart emas, tom chegaralari tasvirlansa yetarli bo'ladi.

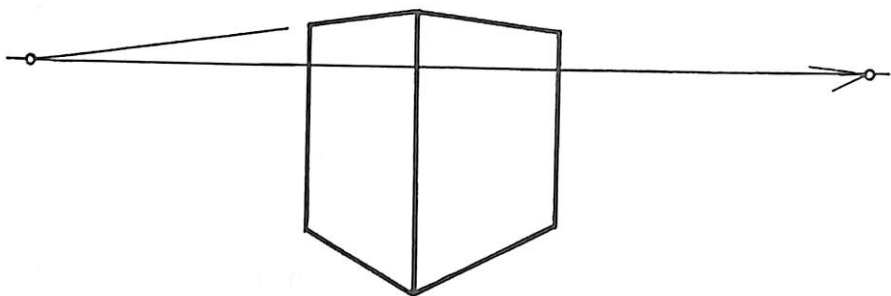


5. Tom qirradi chizig'ining o'ngdagi vertikal chiziq bilan kesishish nuqtasidan chap uchrashish nuqtasiga yo'nalgan chiziq o'tkazing. Tom qirradi chizig'ining chapdagi vertikal chiziq bilan kesishish nuqtasidan o'ng uchrashish nuqtasiga yo'nalgan chiziq o'tkazing.

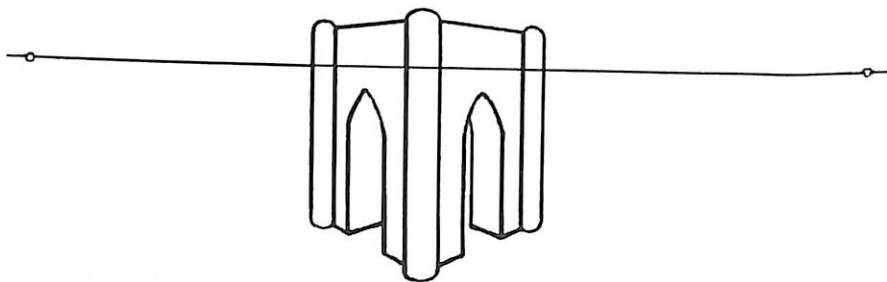




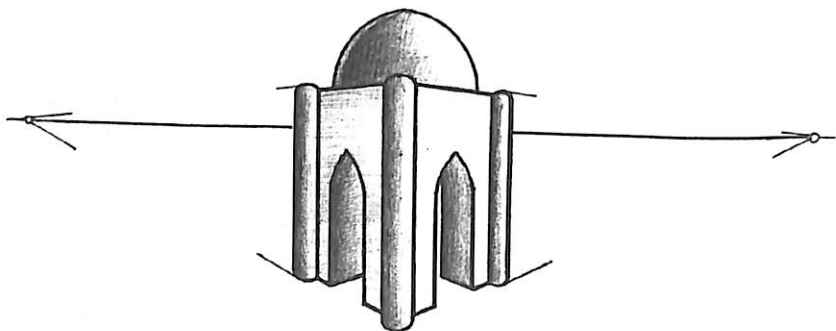
6. Yordamchi chiziqlarni o'chirib tashlang. Shunday qilib bino shaklining tomgacha bo'lgan qismi (quti)ning ikki nuqtali perspektivasi yasaldi.



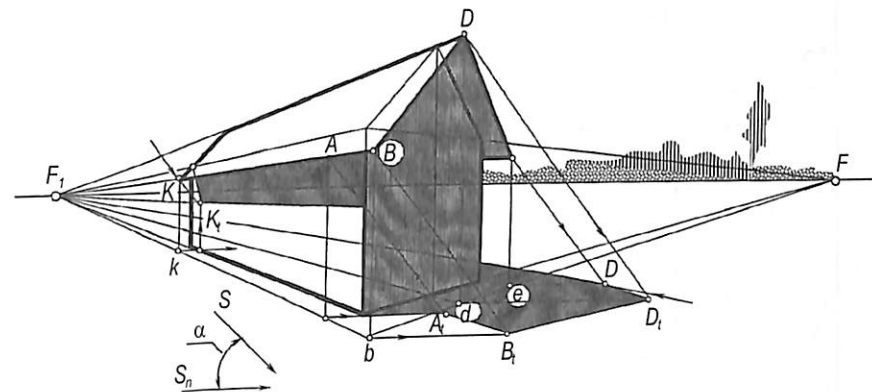
7. Chizilgan shaklda me'moriy yodgorlikning fasadi va plani chizmalaridan foydalanib qo'shimcha detallari (eshiklar, bino qirralaridagi yarimyashirin ustunlar, zarur bo'lsa naqsh elementlari, ...) ikki nuqtali perspektiva qoidalari bo'yicha tasvirlanadi.



8. Tasvirda binoning yetishmaydigan qismi — gumbaz chiziladi, zarur bo'lsa, tasvir bo'yilib, soyalar ko'rsatiladi.



26-shaklda bino perspektiv tasviri va binodan tushayotgan soyalarni bajarish usullari umumlashtirib ko'rsatildi. Bino perspektivasi «ikki nuqtali perspektiva»da bajarishdagi barcha asosiy yordamchi chiziqlar saqlab qoling. Bino soyasini qurishda quyosh nurlari  $S$  yo'nalishda yer sirtiga nisbatan  $\alpha$  burchak ostida tushadi, deb qabul qilingan (26-shakl).  $A_1$  nuqta tom nishabi va bino vertikal devori soylarining o'zaro kesishishi natijasidir.

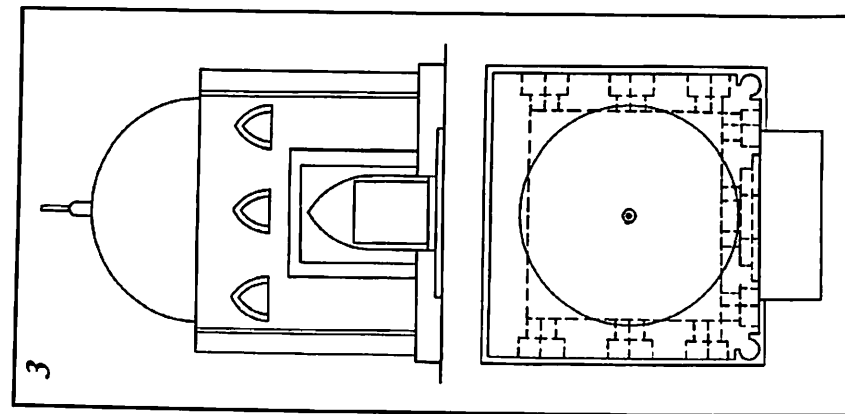
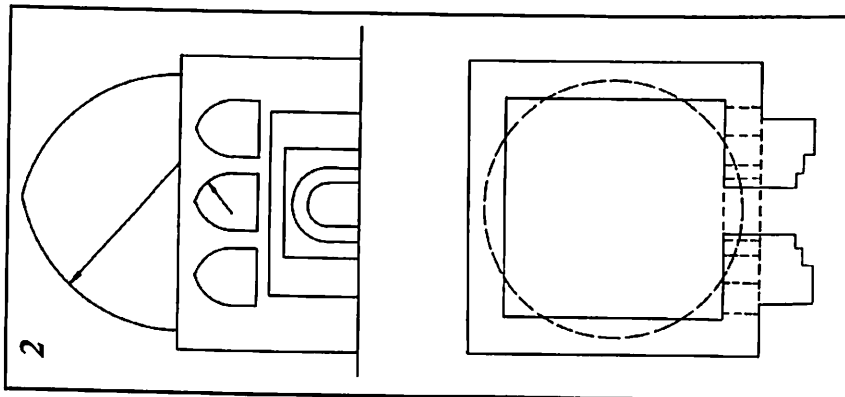
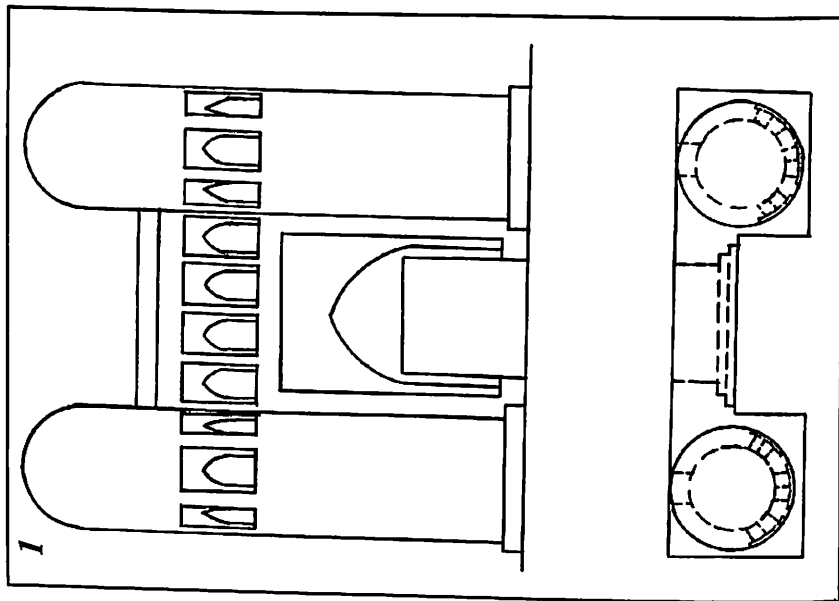


26-shakl. «Ikki nuqtali perspektiva»da bino va soylarini bajarish misoli.

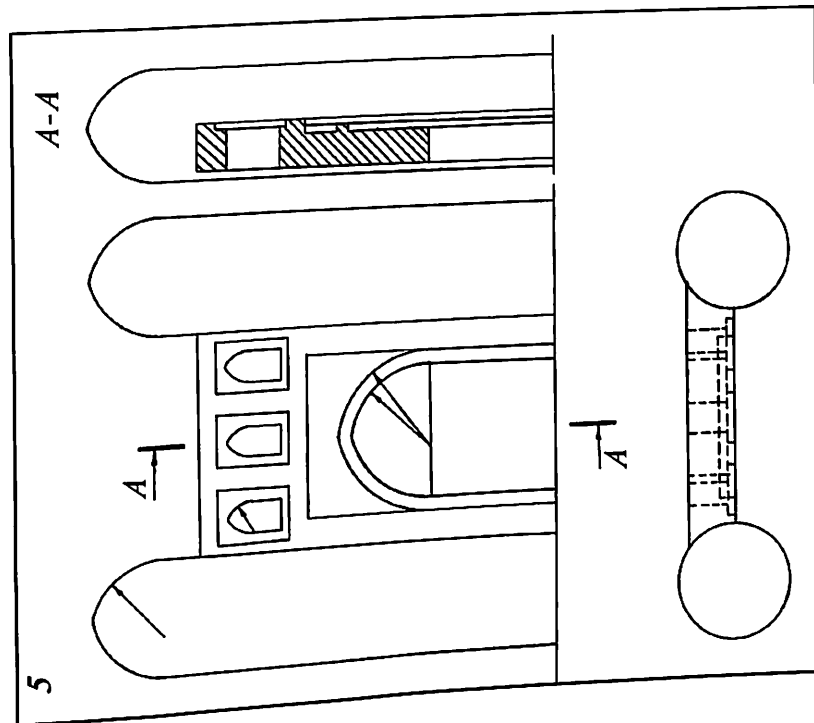
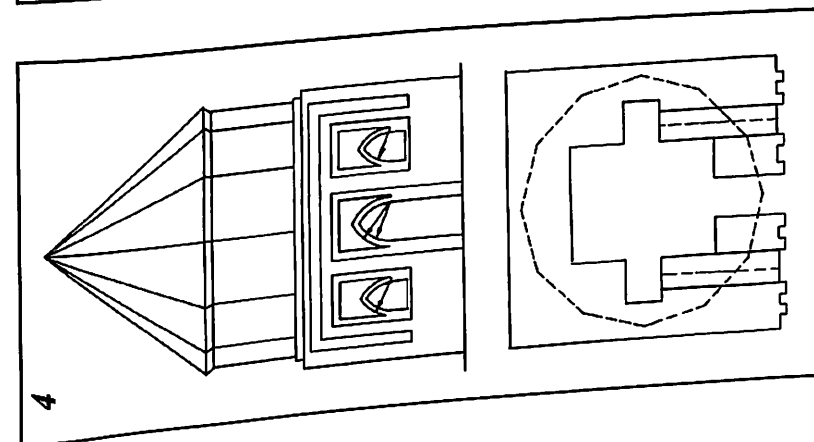
## PERSPEKTIV TASVIRLARNI BAJARISH BO'YICHA TOPSHIRIQ VARIANTLARI

Quyidagi shakllarda mamlakatimizning qadimiy shaharlarida bizgacha yetib kelgan qadimiy me'moriy yodgorliklarning bir-muncha soddalashtirib bajarilgan chizmalari tasvirlangan. Binolarning perspektiv tasvirlarini bajarish bo'yicha quyida keltirilgan ma'lumotlardan foydalanib, me'moriy yodgorliklarning perspektiv tasvirlarini bajaring (27-shakl).

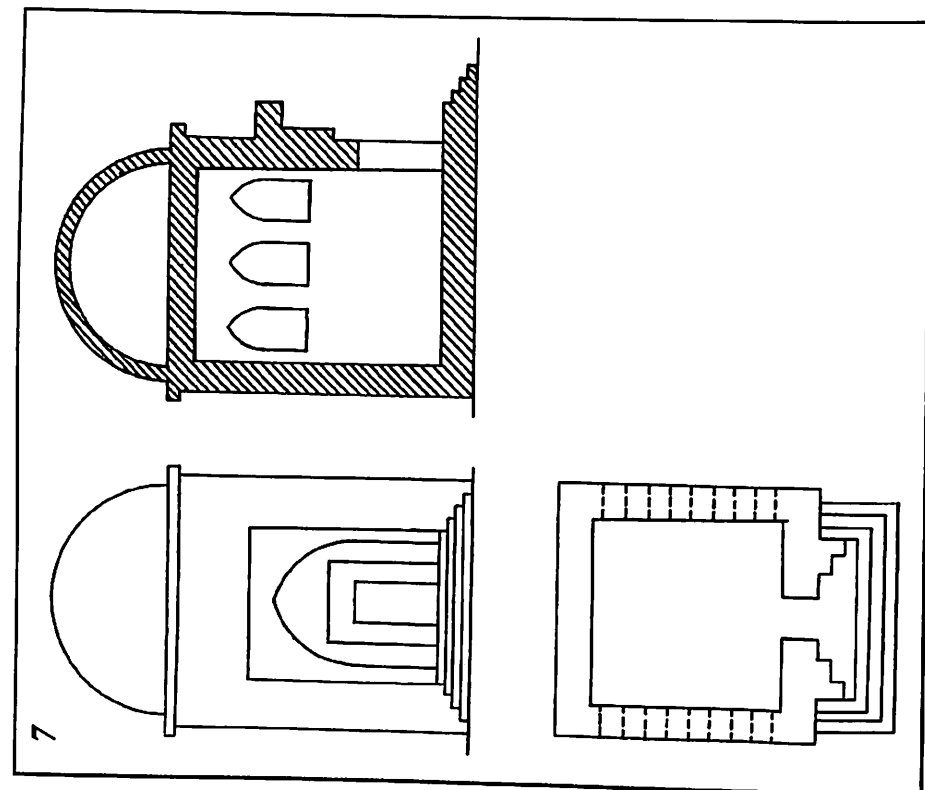
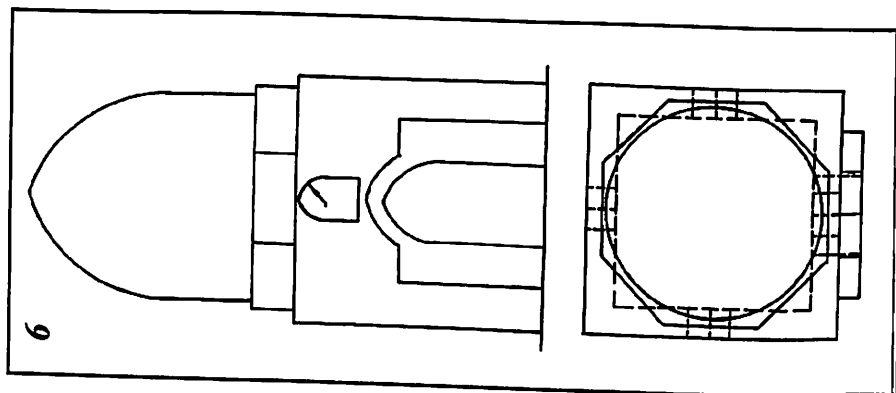
Topshiriq variantlarini tuzishda bino ichki tuzilishi va umumiy shakli haqida to'liqroq tasavvur hosil qilish maqsadida ayrim variantlarda binoning tomdan ko'rinishi tasvirlanib, shtrix chiziqlar yordamida qo'shimcha axborotlar berildi.



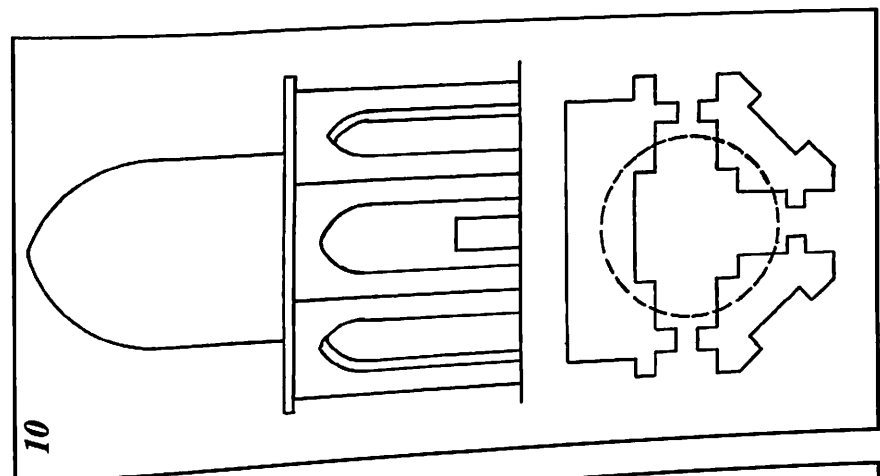
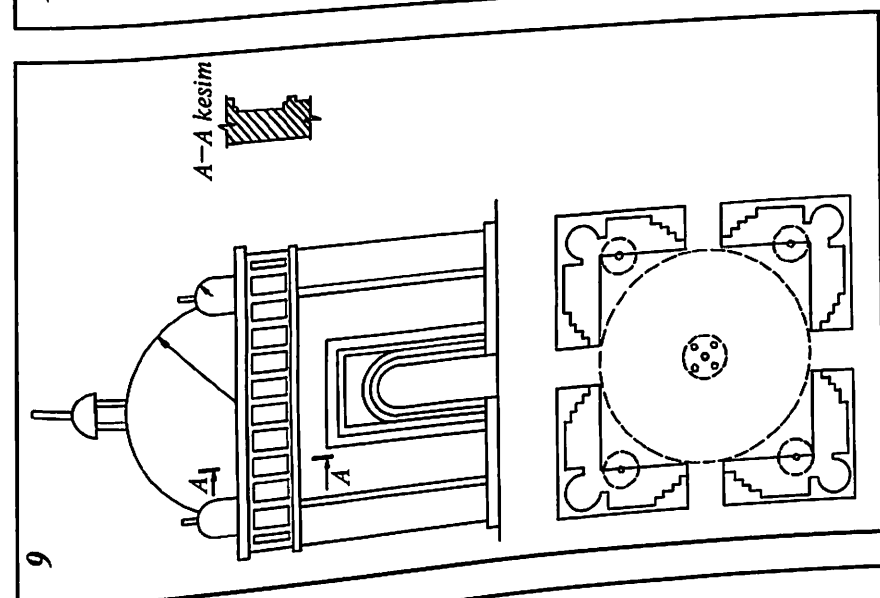
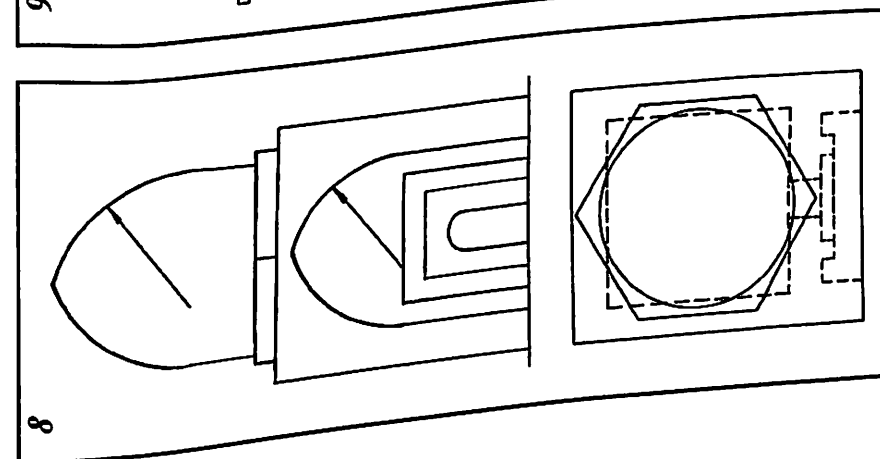
27-shakl.

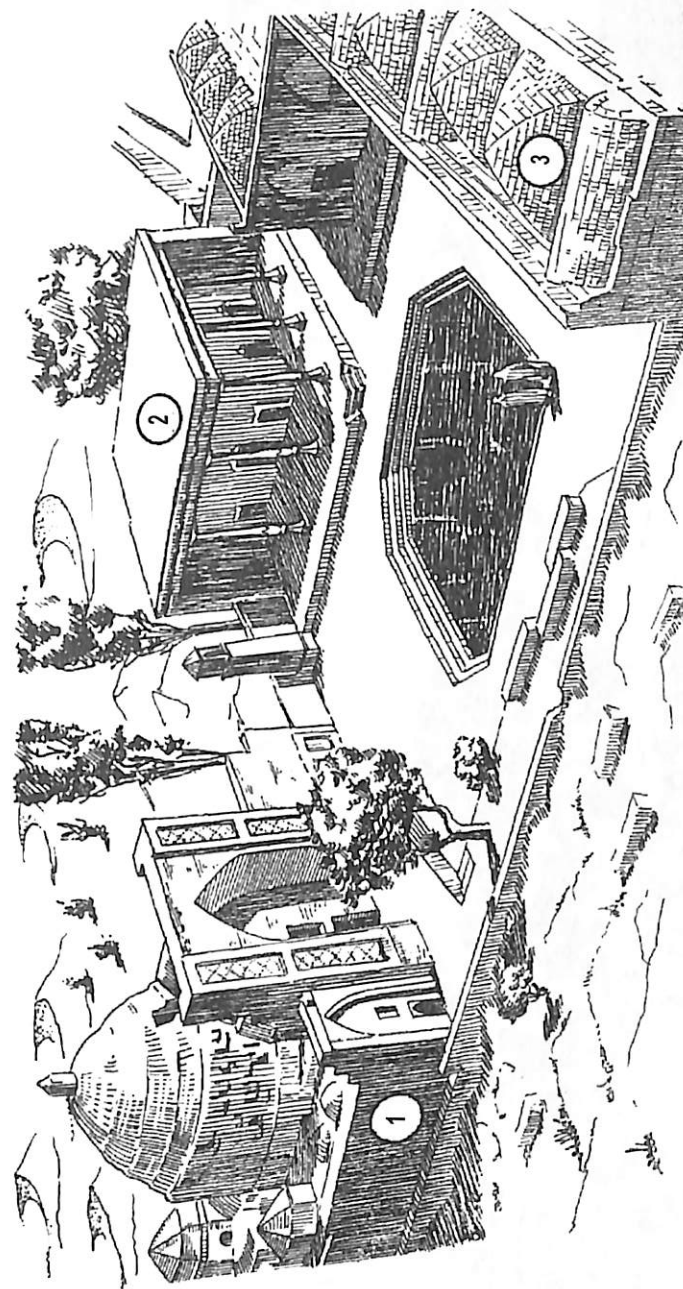
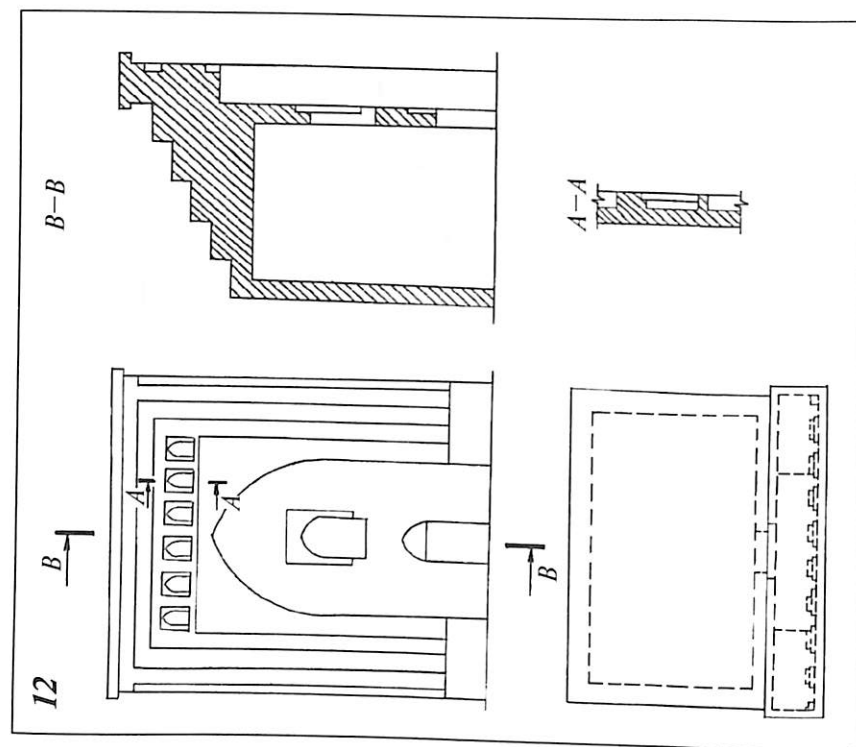
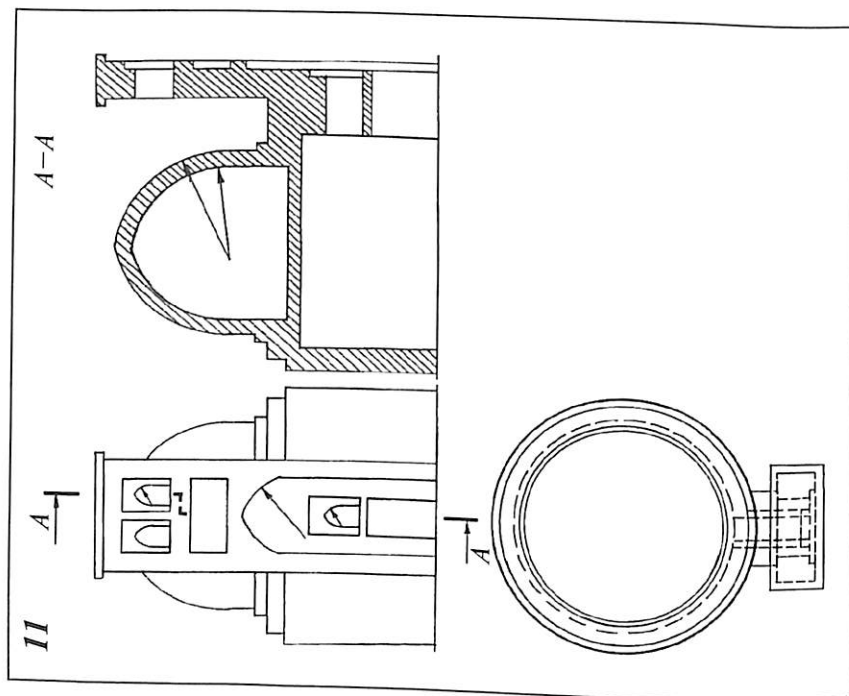


27-shaklning davomi.

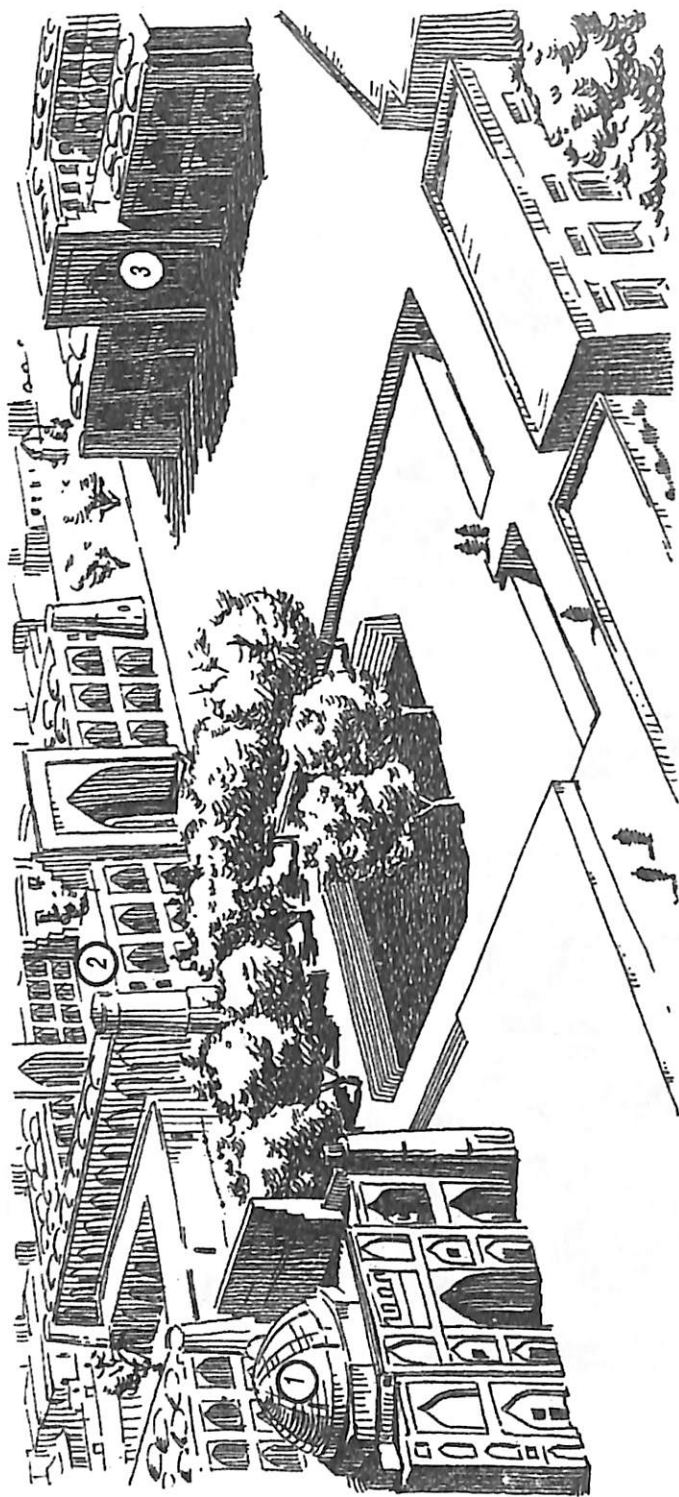


27-shaklning davomi.





**28-shakl.** Samarqanddagi Abdi Dorun me'moriy majmuasi (XV–XIX asrlar).  
Abdi Dorun me'moriy majmuasi tarkibidagi inshootlar: 1 – Abdi Dorun maqbarasi;  
2 – yozgi masjid, xonaqoh (yordamchi binolar); 3 – hovuz.



29-shakl. Buxorodagi Labi Hovuz ansambli (XVI–XVII asrlar).

Labi Hovuz atrofidagi asosiy tarixiy yodgorliklar: 1 – Nodir Devonbegi xonaqohi; 2 – Nodir Devonbegi madrasasi; 3 – Ko'kaldosh madrasasi.

## BOSH PLAN CHIZMALARINI BAJARISH BO'YICHA TOPSHIRIQLAR

28–29-shakllarda Samarqand va Buxoroda XV–XVI asrlarda shakllangan me'moriy majmua va ansambl umumiy ko'rinishlarining yaqqol tasirlari berilgan. Tasvirlarni o'rganib chiqib quyidagi savollarga javob bering va ulardagi asosiy binolar tasvirlangan bosh plan chizmalari eskizini bajaring (o'lchamlar nisbatlarga rioya qilgan holda taxminiy olinadi).

1. Majmua va ansambl tarkibidagi hovuzlar nima maqsadda barpo etilgan?

2. Majmua va ansambl uyg'unligining tarkibiy qismi bo'lgan daraxtlar qanday vazifani bajarishga mo'ljallangan?

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Toshkent — «ILM ZIYO» — 2017

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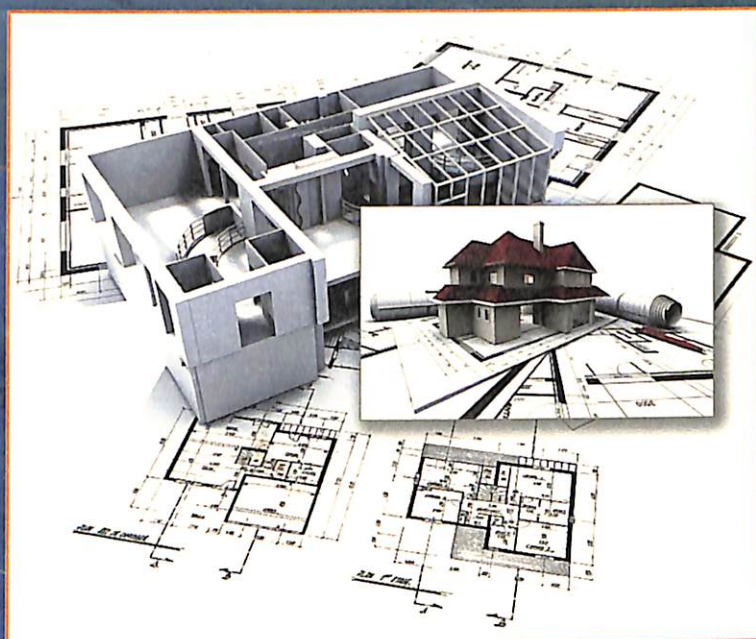
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