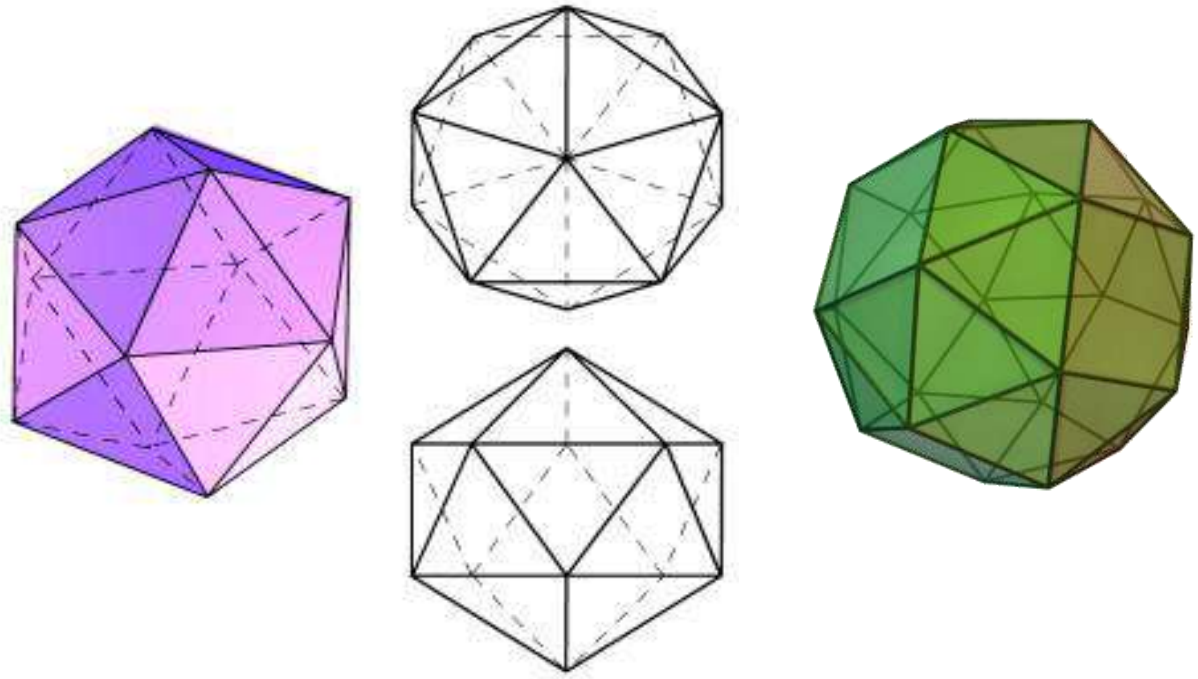
**MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF UZBEKISTAN**
**GULISTON STATE UNIVERSITY**
**DEPARTMENT OF APPLIED ARTS AND DESIGN**

# POLYHEDRA AND THEIR TYPES.
# KO‘PYOQLIKLAR VA UNING TURLARI.



*Gulistan-2026*

**N.O.Yakubova. "Polyhedra and their types. (Ko'pyoqliklar va uning turlari)" – Gulistan, 2026.- 24. p**

Ushbu ma'ruza matni Loyuhalash fanidan o'tiladigan "Ko'pyoqliklar va uning turlari" mavzusiga bag'ishlangan bo'lib, ko'pyoqliklar tekis ko'pburchaklar bilan chegaralangan geometrik jismlar ekanligi tushuntirildi. Ularning asosiy elementlari yoqlar, qirralar va uchlardan iboratligi misollar yordamida yoritildi. Shuningdek, prizma, piramida, kub va parallelepiped kabi ko'pyoqliklarning turlari hamda ularning o'ziga xos xususiyatlari tushuntirildi. Amaliy grafik uchun namuna keltirilgan va talabalar bajarishi uchun topshiriqlar berilgan hamda asosiy atamalar izohli-glossariy keltrilgan. Ma'ruza 1 -bosqich, 60210400 - Dizayn: interyer dizayni ta'lim yo'nalishi talabalariga mo'ljallangan.

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Ma'ruza matni San'atshunoslik fakulteti Ilmiy Kengashi qaroriga asosan (22. 09. 2026 yil 2 -bayonnoma) nashrga tavsiya qilindi.

# POLYHEDRA AND THEIR TYPES.
# KO‘PYOQLIKLAR VA UNING TURLARI.

**Objective:** To provide students with a comprehensive understanding of polyhedra, including their types, fundamental elements (faces, edges, and vertices), and properties. To explain the geometric characteristics of prisms, pyramids, and other polyhedra, and to develop the skills to distinguish between them and identify them through examples from everyday life. To foster students' spatial reasoning, logical thinking, and ability to solve geometric problems.

**Plan:**

1. **Polyhedrons and their types.**
2. **Nets of Polyhedra.**

**Maqsadi:** O‘quvchilarga ko‘pyoqliklar haqida kengroq tushuncha berish, ularning turlari, asosiy elementlari (yoqlari, qirralari va uchlari) hamda xossalarini o‘rgatish. Prizma, piramida va boshqa ko‘pyoqliklarning geometrik xususiyatlarini tushuntirish, ularni bir-biridan farqlash va kundalik hayotdagi misollar orqali tanib olish ko‘nikmalarini rivojlantirish. O‘quvchilarning fazoviy tasavvuri, mantiqiy fikrlashi va geometrik masalalarni yechish qobiliyatini shakllantirish.

**Reja:**

1. **Ko‘pyoqliklar va uning turlari.**
2. **Ko‘pyoqliklar yoyilmalari.**

## 1. POLYHEDRA AND THEIR TYPES.

**Definition.** A geometric figure bounded on all sides by flat polygons is called a polyhedron.

The line segments formed by the intersection of these flat polygons are called the edges of the polyhedron, and the polygons themselves are called its faces. The points where the edges intersect are known as the vertices of the polyhedron.

The collection of all the faces of a polyhedron is called its surface. The vertices and edges of a polyhedron are considered its defining elements. A line segment connecting two vertices that do not lie on the same face is called a diagonal of the polyhedron. If all the defining elements of a polyhedron lie on one side of the plane

containing any one of its faces, it is called a convex polyhedron; otherwise, it is called a concave (or non-convex) polyhedron. There are several types of polyhedra; we will examine the following:

**Pyramid**

Definition. A polyhedron in which one face is a flat polygon and the remaining faces are triangles that share a common vertex is called a pyramid.

The polygon is called the base of the pyramid, and the triangles are called its lateral faces. The common vertex of the lateral edges is also the vertex of the pyramid, and it does not lie in the plane of the base. A pyramid whose base is a regular polygon is called a regular pyramid. If the altitude (height) of a pyramid passes through the center of its base and is perpendicular to it, the pyramid is called a right pyramid; if it is not perpendicular, it is called an oblique pyramid (Figure 1).

**Prism**

Definition. A polyhedron whose lateral faces are quadrilaterals and whose base is a polygon is called a prism.

The lines of intersection of the lateral faces are called the edges of the prism, and the polygons bounded by these edges are called the faces of the prism (figure 2) The polygons formed by the intersection of the prism with parallel planes that cut across all its edges are called the bases of the prism. If the lateral edges are inclined relative to the base, the prism is called an oblique prism; if they are perpendicular to the base, it is called a right prism. A prism whose base is a regular polygon is called a regular prism.

A polyhedron consisting of two polygons lying in parallel planes-which serve as the bases-and lateral faces formed by triangles and trapezoids-which connect the vertices of these bases-is called a prismatoid (figure 3). Polyhedra are classified into various types, including simple convex, simple concave, and star-shaped polyhedra, as well as complex polyhedra formed by the combination of these. Simple convex polyhedra are further divided into regular and semi-regular polyhedra. Regular convex polyhedra have faces consisting of identical regular polygons, equal dihedral angles, and edges of equal length. These polyhedra are primarily of five types and are known as the Platonic solids (table 1).

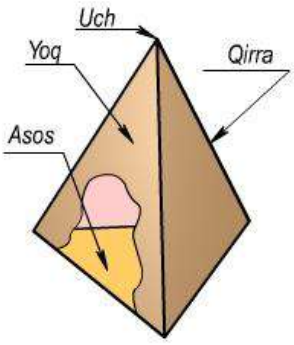



**Figure 1**

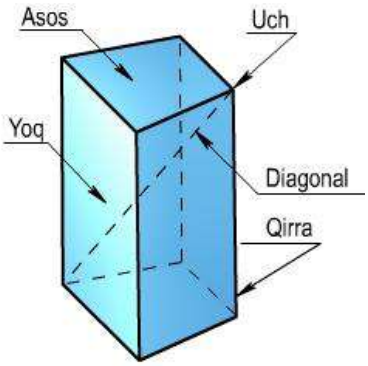



**Figure 2**

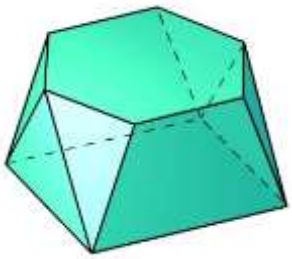
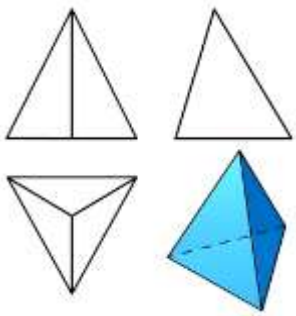
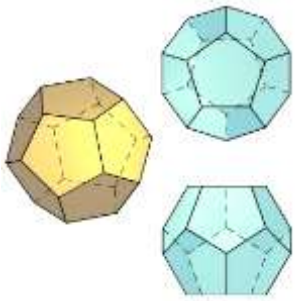
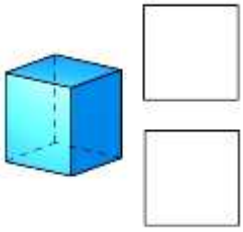
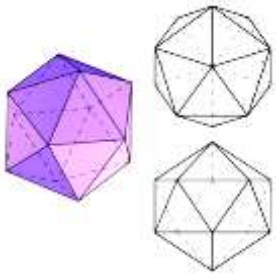
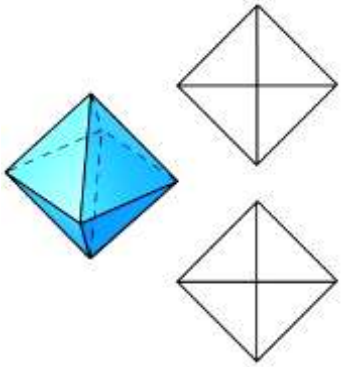
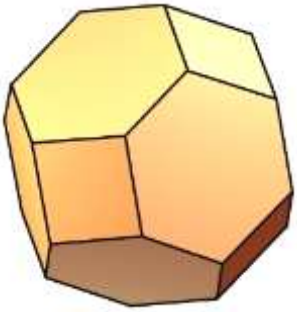


**Figure 3**

Euler described one of the important properties of polyhedra as follows: Euler's Theorem. In any convex polyhedron, the sum of the number of faces and the number of vertices, minus the number of edges, is equal to two (i.e., F + V - E = 2).

**Table 1**

**Regular polyhedra**

| | | |
|---|---|---|
| Tetraedr  | Dodekaedr  | Kub – geksaedr**)**  |
| Ikosaedr  V + F - E = 2<br>V – number of vertices<br>F – number of faces<br>E – number of edges | Oktaedr  | Truncated octahedron  |

A polyhedron whose faces consist of various types of regular polygons is called a semi-regular polyhedron. There are 18 such polyhedra, known as Archimedean solids. An illustration of one of these Archimedean solids-the truncated octahedron-is provided.

In engineering, polyhedra are widely used in the creation of various machine components and multi-faceted lenses, as well as in architecture and construction. For instance, wall and foundation blocks, reinforced concrete panels for roofs and bridges, and other structural elements are often polyhedral in form. Furthermore, polyhedra are extensively utilized in the construction of “geodesic” domes, which allow for the roofing of large-span buildings without the need for supporting columns. In historical architecture, they were also employed as decorative ornaments-specifically in domes, the areas beneath domes, and the transitional sections between a dome and the prismatic (polygonal-walled) base of a structure.

## 1. KO‘PYOQLIKLAR VA UNING TURLARI.

**Ta’rif**. Hamma tomonidan tekis ko‘pburchaklar bilan chegaralangan geometrik rasm - **ko‘pyoqlik** deyiladi.

Tekis ko‘pburchaklarning o‘zaro kesishuvidan hosil bo‘lgan kesmalar, ko‘pyoqlikning-qirralari va qirralar orasidagi ko‘pburchaklarni uning yoqlari deb ataladi. Qirralarning o‘zaro kesishuv nuqtalari ko‘pyoqlikning uchlari deb yuritiladi.

Ko‘pyoqlikning barcha yon yoqlarining yig‘indisi uning sirti deb ataladi. Ko‘pyoqlikning uchlari va qirralari uning *aniqlovchilari* hisoblanadi. Ko‘pyoqlikning bir yon yog‘ida yotmagan ikki uchini birlashtiruvchi kesma uning *diagonali* deb ataladi. Ko‘pyoqlik aniqlovchilari uning istalgan yon yog‘iga (tekislikka) nisbatan bir tomonda joylashsa, uni *qabariq ko‘pyoqlik*, aksincha *botiq ko‘pyoqlik* deb yuritiladi. Ko‘pyoqliqlarining bir necha turlari mavjud bo‘lib, ulardan quyidagilarni ko‘rib chiqamiz:

**Piramida**

**Ta’rif**. Yoqlaridan biri tekis ko‘pburchak bo‘lib, qolgan yoqlari esa umumiy uchga ega bo‘lgan uchburchaklardan tuzilgan ko‘pyoqlik **piramida** deyiladi.

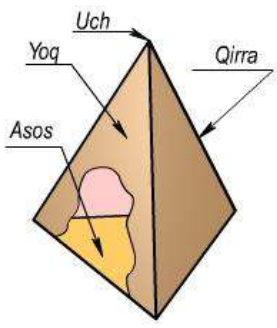
Ko‘pburchak piramidaning asosi va uchburchaklar esa uning yon yoqlari deb ataladi. Yon yoqlarining umumiy uchi piramidaning ham uchi hisoblanadi va u asos tekisligida yotmaydi. Asosi muntazam ko‘pburchakli piramida *muntazam piramida* deb ataladi. Piramida balandligi asosining markazidan o‘tib, unga perpendikulyar bo‘lsa, uni to‘g‘ri piramida, perpendikulyar bo‘lmasa og‘ma piramida deb yuritiladi (1-rasm).

**Prizma**

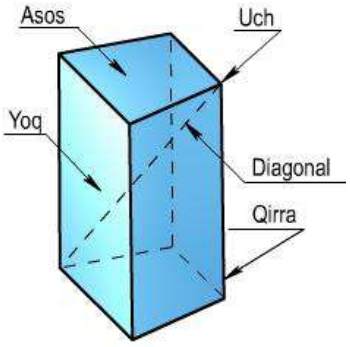
**Ta’rif**. Yon yoqlari to‘rt burchaklardan va asosi ko‘p burchakdan iborat bo‘lgan ko‘pyoqlik **prizma** deyiladi.

Yon yoqlarning kesishuv chiziqlari – prizma *qirralari*, qirralar orasidagi ko‘p burchaklining yoqlari deyiladi (2-rasm). Prizmani barcha qirralarini kesuvchi parallel tekisliklarda hosil bo‘lgan ko‘pburchaklar–prizmaning asoslari deb ataladi. Yon qirralari asosiga nisbatan og‘ma yoki perpendikulyar bo‘lsa, prizma ham mos ravishda *og‘ma* yoki *to‘g‘ri prizma* deb atladi. Asosi muntazam ko‘pburchak bo‘lgan prizma, *muntazam prizma* deb yuritiladi.

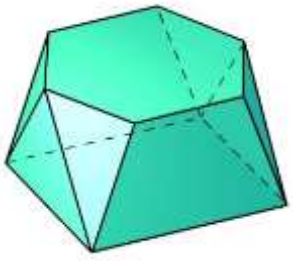
Asoslari o‘zaro parallel tekisliklarda yotgan ikkita ko‘pburchakdan va yon yoqlari esa asos uchlaridan o‘tuvchi uchburchaklar va trapesiyalardan iborat bo‘lgan ko‘pyoqlik *prizmatoid* deyiladi (3-rasm). Ko‘pyoqliklar bir jinsli qabariq, bir jinsli botiq, yulduzsimon hamda ularning birlashishidan hosil bo‘lgan murakkab ko‘pyoqliklarga bo‘linadi. Bir jinsli qabariq ko‘pyoqliklar muntazam va yarim muntazam ko‘pyoqliklarga ajraladi. Muntazam qabariq ko‘pyoqliklar o‘zaro teng bir xil muntazam ko‘pburchaklardan iborat yoqlarga, o‘zaro teng ikki yoqli burchaklarga va o‘zaro teng qirralarga ega bo‘ladi. Bu ko‘pyoqliklar asosan besh xil bo‘lib *Platon jismlari* deb yuritiladi (1-jadval).




1-rasm




2-rasm



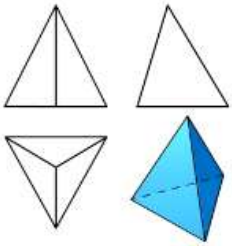
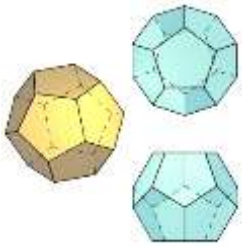
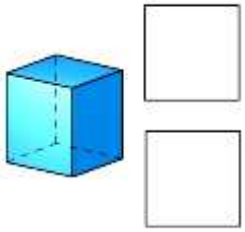
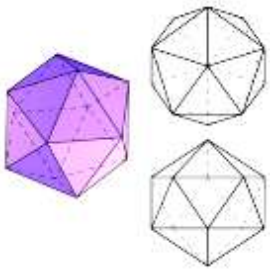
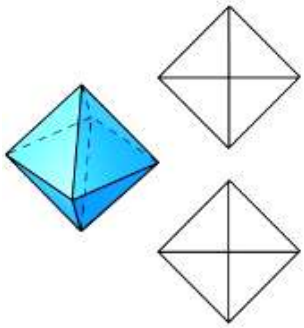
3-rasm

Ko‘pyoqliklarning muhim xossalaridan birini Eyler quyidagicha bayon etgan:

**Eyler teoremasi.** Har qanday qavariq ko‘pyoqlikda yoqlar bilan uchlar sonining yig‘indisidan qirralar sonining ayirmasi ikkiga teng bo‘ladi (ya’ni YO+U-Q=2).

**1-jadval**

**Muntazam ko‘pyoqliklar**

| | | |
|---|---|---|
| Tetraedr  | Dodekaedr  | Kub – geksaedr**)**  |
| Ikosaedr  YO + U - Q = 2<br>YO – yoqlar soni<br>U – uchlar soni<br>Q – qirralar soni | Oktaedr  | Kesik oktaedr  |

Yon yoqlari turli rasmdagi muntazam ko‘pburchaklardan iborat bo‘lgan ko‘pyoqlikni *yarim muntazam ko‘pyoqlik* deb yuritiladi. Bu ko‘pyoqliklar 18 xil bo‘lib, ular *Arximed jismlari* deb yuritiladi. Arximed jismlaridan biri bo‘lgan kesik oktaedrning yaqqol tasviri keltirilgan.

Ko‘pyoqliklar texnikada turli ko‘rinishdagi mashina detallari, ko‘pyoqli linzalar yasashda, hamda arxitektura va qurilish ishlarida keng ishlatiladi. Masalan, devor va poydevor bloklari, tom, ko‘priklarning temir-beton panellari va inshootning boshqa qismlari ko‘pyoqliklardan iborat bo‘ladi. Ko‘pyoqliklardan yana *“geodezik”* gumbazlar yasashda, keng oraliqli binolarni ustunsiz yopishda

keng foydalaniladi. Qadimiy binolarda esa gumbaz, gumbaz osti, bino gumbazidan prizmatik qismiga o‘tish joylarida bezak-ornament sifatida ham qo‘llanilgan.

## 2.DEVELOPMENTS OF POLYHEDRA

To construct the complete development of a polyhedron, one must create the developments of its lateral faces and bases. Constructing such faces (whether triangles or polygons) in a development is equivalent to constructing faces that are congruent to the original ones. To construct these faces in a development, the true lengths of their sides-that is, their edges-must be known. If these true lengths are not already present in the drawing, they can be determined using various methods.

Problem 1. Construct the development of a right triangular prism whose base lies on the H-plane (Figure 4).

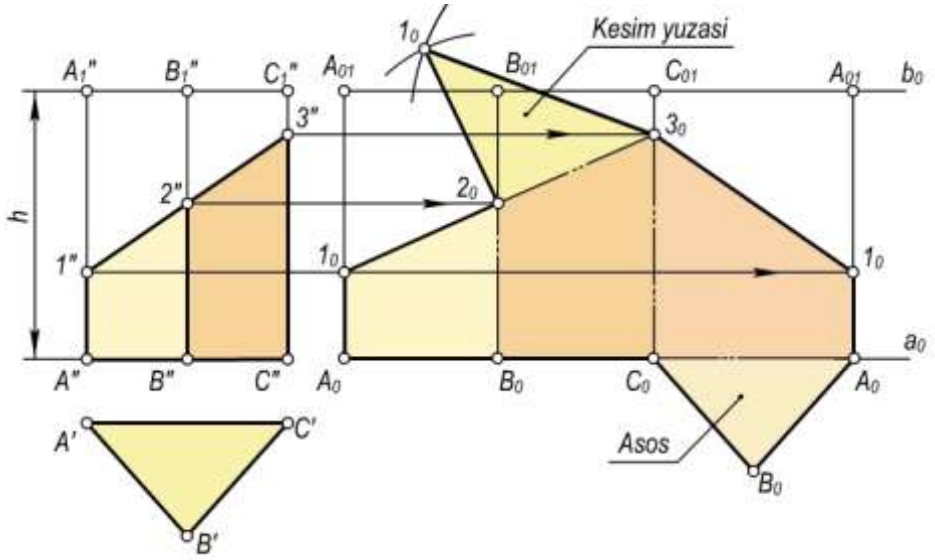



Figure 1

**Solution.** The lateral edges of the prism are represented at their true lengths in the frontal projection, while the base edges are shown at their true lengths in the horizontal projection. To construct the development (net) of the prism, one must first imagine cutting it along one of its edges-for example, edge $AA_1$. Then, three rectangles (representing the lateral faces) are constructed side by side. The height of these rectangles corresponds to the height h of the prism, while their bases correspond to the segments A′B′, B′A′ and C′A′respectively. By attaching the bases to this lateral surface development, the complete development of the prism is obtained.

In the case of the three-sided oblique prism shown in Figure 5, since the lateral edges are in a frontal position, their true lengths are equal to the segments A"A_1", B"B_1", and C"C_1". Because the bases are in a horizontal position, the true lengths of the base edges are equal to the segments A'B', B'A', and C'A'. For such an oblique prism, it is convenient to construct the development using the "normal section" method. To do this, an arbitrary plane N (denoted as NV) is established perpendicular to the lateral edges of the oblique prism. This results in the projections (1'2'3' and 1"2"3") of the normal sectiona triangle 1,2,3. Then, the true size of the normal section $\Delta$ $\Delta 1_0 2_0 3_0$ is constructed using the rotation method.

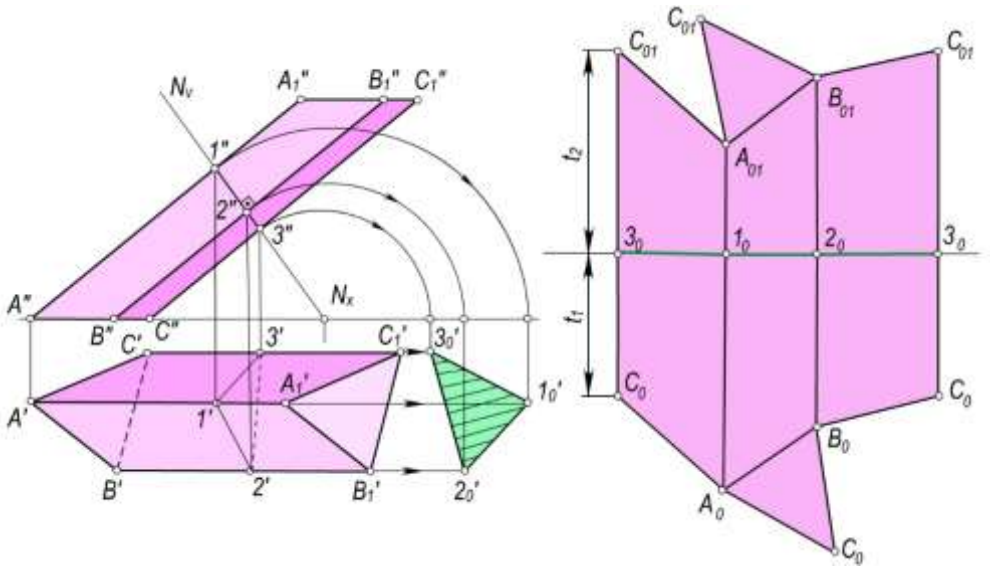



Figure 5

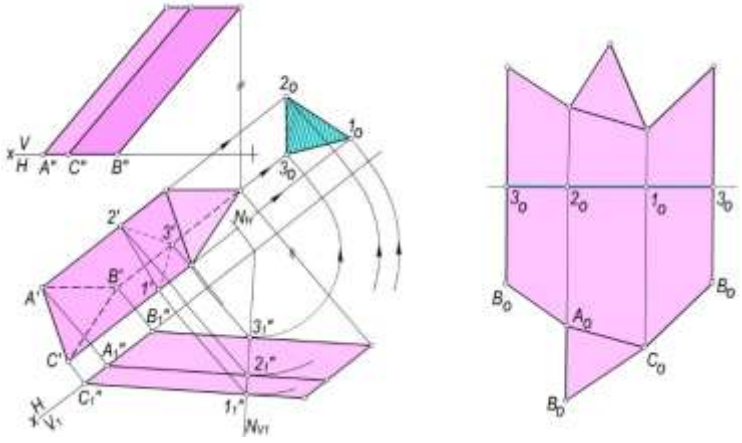
To construct the development, draw a thin auxiliary line, $a_0$, in any available (empty) space. Along this line, mark off the true lengths of the sides of the normal cross-section, starting from a specific point (e.g., point $3_0$) (Figure 5b). From the resulting points $3_0$, $1_0$, $2_0$, and $3_0$ draw lines perpendicular to the line $a_0$. Measure and mark the true lengths of the edges along these perpendicular lines. The development shows the marking of the edge as $C''3''=C_0 3_0$ and $3''C''=3_0 C_0$ Connect the endpoints of the resulting edges. Combining the development of the prism's lateral surface with the true size of its base yields the complete development.

**Problem 2.** Construct the development of a triangular prism whose lateral edges are in a general position (Figure 6, a).

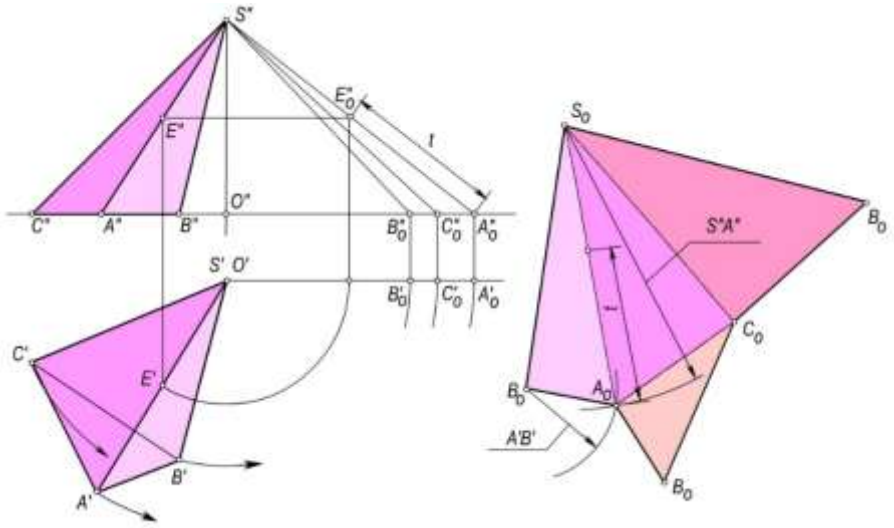
**Solution.** This problem is solved based on the principles discussed in the preceding problem. First, it is necessary to determine the true lengths of the prism's edges and its normal cross-section. This is best achieved by performing a change of projection planes (aligning them parallel to the prism's edges). The remaining construction steps and the generation of the development are straightforward and require no further explanation (Figure 7, b).

**Problem 3.** Construct the complete development of an oblique triangular pyramid whose base lies on the H-plane (Figure 10.5, a).

**Solution.** The triangulation method is used to construct the developments (unfoldings) of surfaces such as pyramids. To do this, the true lengths of the pyramid's lateral edges are first determined; in the drawing, these are found using the rotation method. The true lengths of the base edges are equal to the segments A′B′, B′C′, and C′A′. To construct the development of the pyramid's lateral surface, a point S0 is marked in an empty space on the drawing (Figure 8, b). A segment S0B0, equal in length to S″B″, is laid off along a straight line passing through this point—this assumes the pyramid is cut along the lateral edge SB. Next, two arcs are drawn: one centered at B0 with a radius of B0A0 = B′A′, and another centered at S0 with a radius of S0A0 = S″A0″. The intersection of these arcs defines point A0. By connecting points S0, B0, and A0, the position of the face ΔABC in the development is established. The developments of the remaining lateral faces are constructed in the same manner. Adding the development of the pyramid's base to the constructed lateral surface development yields the complete development of the pyramid's entire surface.




a) 7-rasm b)

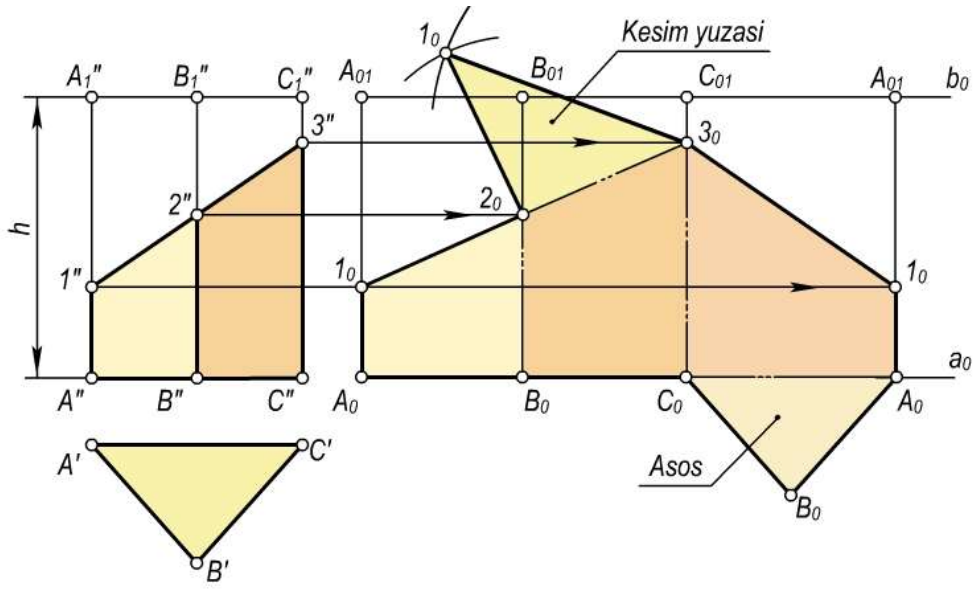



a) 8-rasm b)

## 2. KO‘PYOQLIKLAR YOYILMALARI

Ko‘pyoqliklar to‘la yoyilmasini yasash uchun uning yon yoqlari va asoslarining yoyilmalari yasaladi. Bunday yoqlar (uchburchak yoki ko‘pburchak) ni yoyilmada yasash ularga teng bo‘lgan yoqlarni yasash demakdir. Bunday yoqlarni yoyilmada yasash uchun tomonlari ya’ni qirralarining xaqiqiy uzunliklari bo‘lishi kerak. Agar ularning xaqiqiy uzunliklari chizmada bo‘lmasa, ularni turli usullar orqali yasash mumkin.

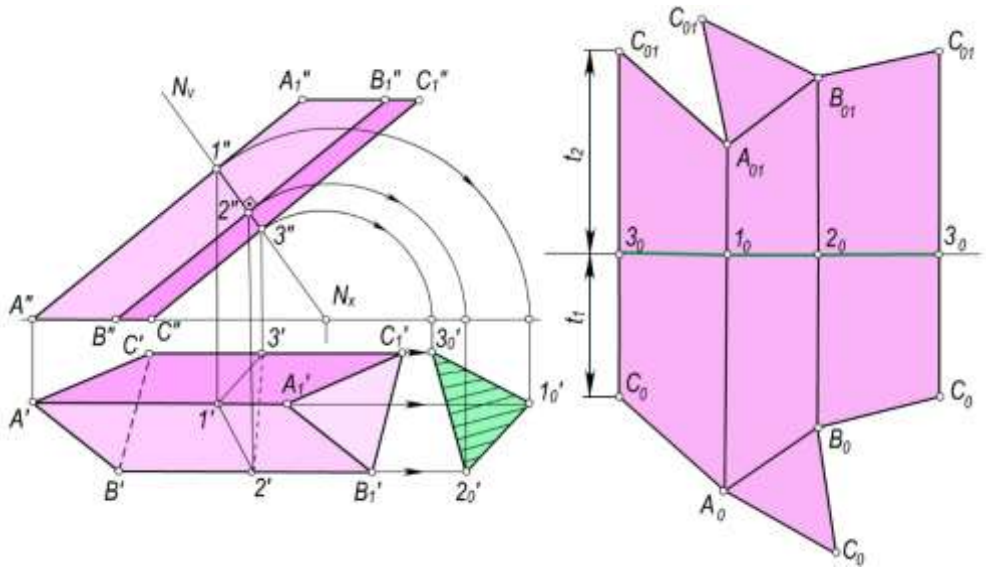
**1-masala.** Asosi H tekislikda yotgan uchburchakli to‘g‘ri prizmaning yoyilmasini yasash talab qilinsin (4 -rasm).




4-rasm

***Yechish.*** Prizmaning yon qirralari frontal proyeksiyada, asosidagi qirralari esa gorizontal proyeksiyada xaqiqiy uzunlikda tasvirlangan. Prizmaning yoyilmasini yasash uchun dastlab uning biror masalan, $AA_1$ qirrasi bo‘ylab xayolan kesish kerak. So‘ngra uchta to‘g‘ri to‘rtburchaklar (yon yoqlar) yonma-yon qo‘yib yasaladi. Bu to‘rburchaklarning balandligi prizmaning balandligi h ga, asoslari esa mos ravishda A′B′, B′A′ va C′A′kesmalarga teng bo‘ladi. Hosil bo‘lgan yon sirtning yoyilmasiga asoslari qo‘shiladi va prizmaning to‘la yoyilmasi hosil bo‘ladi.

5-rasmlarda berilgan uch yoqli og‘ma prizmaning yon qirralari frontal vaziyatda bo‘lgani uchun ularning haqiqiy uzunliklari $A''A_1''$, $B''B_1''$ va $C''C_1''$ kesmalarga teng bo‘ladi. Asoslari gorizontal vaziyatda bo‘lganligi uchun asos qirralarining haqiqiy qiymati A′B′, B′A′ va C′A′ kesmalarga teng bo‘ladi. Bunday og‘ma prizmaning yoyilmasini normal kesim usulida yasash qulay hisoblanadi. Buning uchun og‘ma prizmaning yon qirralariga perpendikulyar qilib ixtiyoriy $N(N_V)$ tekislik o‘tkaziladi. Normal kesim 123 uchburchakning proyeksiyalari (1′2′3′, 1″2″3″) ni hosil qilinadi. So‘ngra normal kesimning haqiqiy kattaligi $\Delta 1_0 2_0 3_0$ aylantirish usulida yasaladi




5-rasm

Yoyilmani yasash uchun ixtiyoriy (bo‘sh) joyda $a_0$ – yordamchi chiziqni ingichka qilib o‘tkaziladi. Bu chiziqqa normal kesim tomonlarning haqiqiy uzunliklari biror (masalan, $3_0$) nuqtadan boshlab o‘lchab qo‘yiladi (5 b-rasm). Hosil bo‘lgan $3_0$, $1_0$, $2_0$ va $3_0$ nuqtalardan $a_0$ chiziqqa perpendikulyar vaziyatda chiziq o‘tkaziladi. Bu chiziqlarga qirralarning haqiqiy uzunliklari o‘lchab qo‘yiladi.

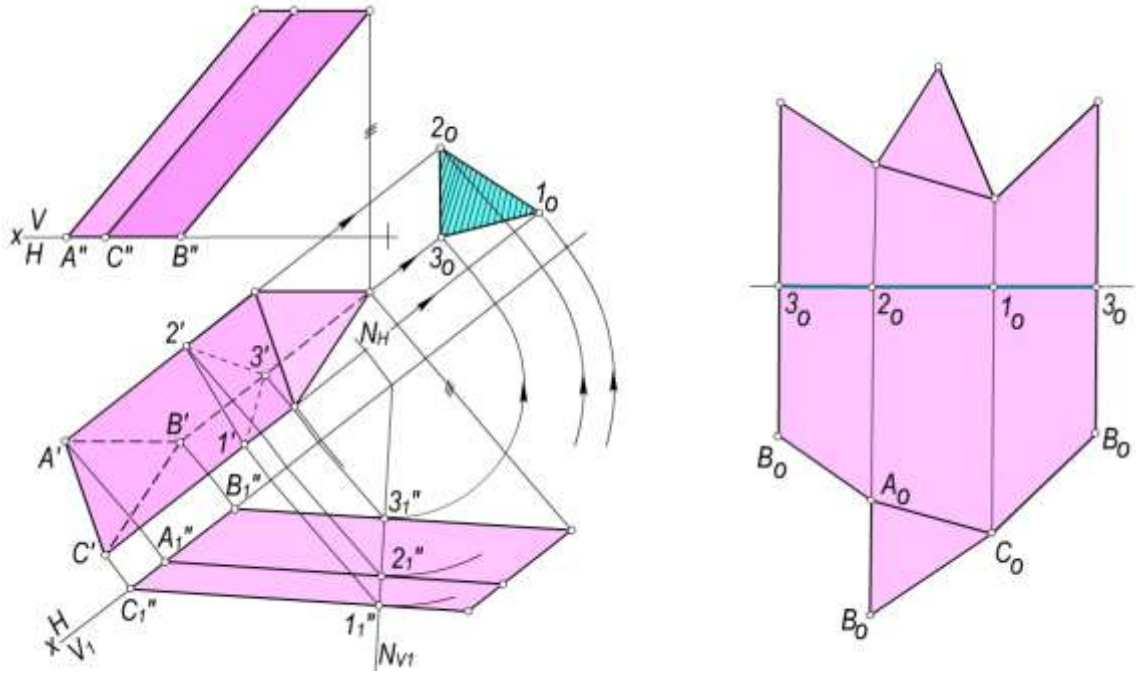
Yoyilmada $C''3''=C_03_0$ va $3''C''=3_0C_0$ qirraning o‘lchab qo‘yilishi ko‘rsatilgan. Hosil bo‘lgan qirralarning uchlari o‘zaro tutashtiriladi. Prizma yon sirti va asosining haqiqiy kattaligi yoyilmasi qo‘shilib to‘la yoyilma hosil bo‘ladi.

**2-masala.** Berilgan yon qirralari umumiy vaziyatda bo‘lgan uch yoqli prizmaning yoyilmasini yasash talab etilsin (6,a-rasm).

***Yechish.*** Mazkur masala yuqorida keltirilgan masala asosida yechiladi. Dastlab prizma qirralari va normal kesimining haqiqiy uzunliklarni yasash kerak bo‘ladi. Buni esa proyeksiyalar tekisliklarini (prizma qirralariga parallel vaziyatda) almashtirish bilan amalga oshirish maqsadga muvofiqdir. Chizmadagi qolgan yasashlar va yoyilmaning hosil qilinishi ortiqcha tushuntirishlarni talab qilmaydi (7,b-rasm).

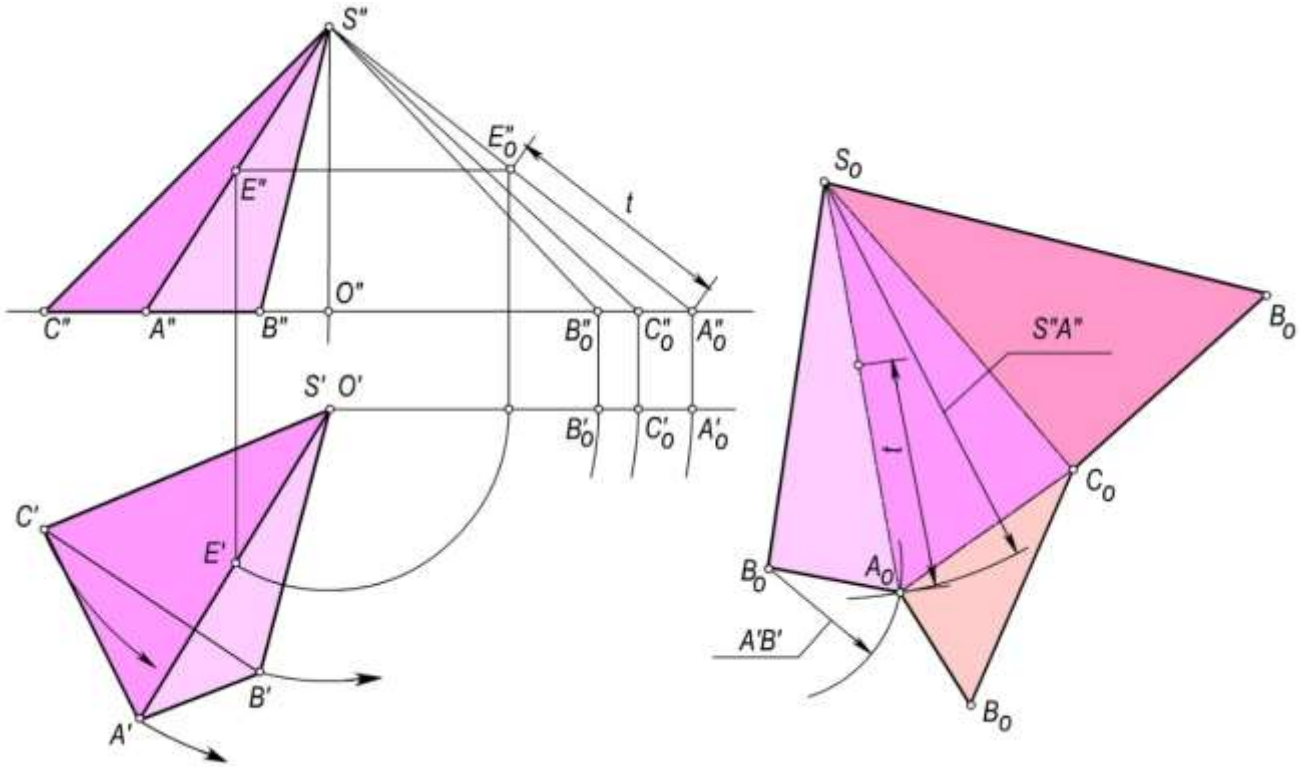
**3-masala.** Asosi H tekislikka tegishli bo‘lgan uch yoqli og‘ma piramidaning to‘la yoyilmasi yasalsin (10.5,a-rasm).

***Yechish.*** Piramida kabi sirtlarning yoyilmalarini yasashda ***uchburchak usulidan*** foydalaniladi. Buning uchun dastlab piramida yon qirralarining haqiqiy uzunliklari yasaladi. Chizmada ular aylantirish usuli yordamida topilgan. Asos qirralarining haqiqiy uzunliklari $A'B'$, $B'C'$ va $C'A'$ kesmalarga teng bo‘ladi. Piramida yon sirtining yoyilmasini yasash uchun chizmaning ixtiyoriy (bo‘sh) joyida $S_0$ nuqta belgilab olinadi (8,b-rasm). Bu nuqtadan o‘tuvchi to‘g‘ri chiziqqa $S_0B_0=S''B''$ kesma o‘lchab qo‘yiladi. Chunki piramida SB qirrasi bo‘yicha kesilgan deb faraz qilinadi. So‘ngra markazi $B_0$ nuqtada, radiusi $B_0A_0=B'A'$ bo‘lgan va markazi $S_0$ nuqtada, radiusi $S_0A_0=S''A_0''$ bo‘lgan ikkita yoy chiziladi. Bu yoylarning kesishuvidan $A_0$ nuqta hosil bo‘ladi. $S_0B_0A_0$ nuqtalar o‘zaro tutashtirilib $\Delta ABC$ ning yoyilmadagi o‘rni hosil qilinadi. Qolgan yon yoqlarning yoyilmalari ham shu tarzda yasaladi. Hosil bo‘lgan yon sirtning yoyilmasiga piramida asosining yoyilmadagi o‘rni qo‘shilsa, piramida to‘la sirtining yoyilmasi hosil bo‘ladi.




a) b)

7-rasm

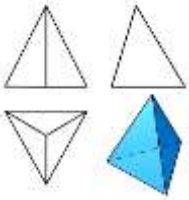
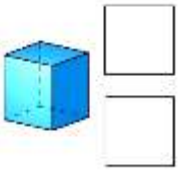
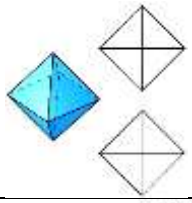
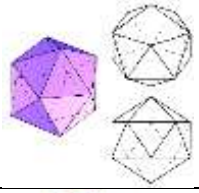
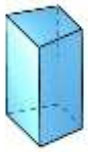
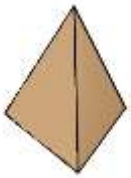
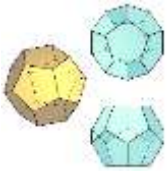



a) 8-rasm b)

**O‘z-o‘zini baholash (Charxpalak) uslubi**

**1-jadvalda keltirilgan ko‘pyoqlikning tasviri asosida uning nomlarini aniqlang.**

1-jadval.

| № | Qo‘pyoqlikning tasviri | Ko‘pyoqlikning turlari | | | | | | | To‘ g‘ ri javob |
|---|---|---|---|---|---|---|---|---|---|
| | | Piramida | Ikosaedr. | Prizma | Tetraedr | Oktaedr | Dodekaedr. | Kub. | |
| 1. |  | | | | | | | | |
| 2. |  | | | | | | | | |
| 3. |  | | | | | | | | |
| 4. |  | | | | | | | | |
| 5. |  | | | | | | | | |
| 6. |  | | | | | | | | |
| 7. |  | | | | | | | | |

Yuqoridagi jadvaldagi «Charxpalak» texnologiyasida **ko‘pyoqlikning tasviri asosida uning nomlarini** aniqlash ko‘rsatilgan.

Bu metod yordamida bitta o‘quvchini emas, balki guruh-guruhga ajratib ular o‘rtasida musobaqa shaklida o‘tkazish ham mumkin. Bu metod orqali o‘qituvchi, o‘quvchi va talabalarga nafaqat nazariy bilim beradi, balki shu bilan birga ularning olgan bilimlarini aniqlashi ham mumkin.

## TEST

Talabaning nazariy va amaliy bilim, ko‘nikmalarni egallanganlik darajasini aniqlash uchun test savollaridan foydalanish tekshirishning bir usuli hisoblanadi. Quyida shunday test savollari keltirilgan.

1.Nechta muntazam ko‘pyoqliklar bor?

A. 12 ta

B. 7 ta

D. 5 ta

E. 16 ta 77

2. Muntazam ko‘pyoqliklar qanday jismlar deb ataladi?

A. Arximed jismlari

B. Platon jismlari

D. Evklid jismlari

E. Aristotel jismlari

3. Yarim muntazam ko‘pyoqliklar qanday jismlar deb ataladi?

A. Eynshten jismlari

B. Arximed jismlari

D. Monj jismlari

E. Platon jismlari

4. Yarim muntazam ko‘pyoqliklar qanday hosil bo‘ladi?

A. Muntazam ko‘pyoqliklarni o‘rtasidan kesganda

B. Bo‘shliq ko‘pyoqliklarning uchlarini kesganda

D. Prizma va piramidaning uchlarini kesganda

E. Muntazam ko‘pyoqliklarning uchlarini kesganda

5. Dodekaedrninng nechta uchlari bor?

A. 16 ta

B. 22 ta

D. 18 ta

E. 20 ta

6. Ikosaedrning nechta uchlari bor?

A. 12 ta

B. 19 ta

D. 14 ta

E. 22 ta

7. Ikosaedrning nechta yoqi bor?

A. 20 ta

B. 30 ta

D. 24 ta

E. 26 ta

8. Dodekaedrning nechta yoqi bor?

A. 12 ta

B. 16 ta

D. 20 ta

E. 14 ta. 78

9. Oktaedrning nechta yoqi bor?

A. 8ta

B. 6ta

D. 12 ta

E. 10 ta

10. Uch yoqli piramidani tekislik bilan kesganda ko‘pi bilan nechta burchaklik hosil bo‘ladi.

A. Uchburchaklik

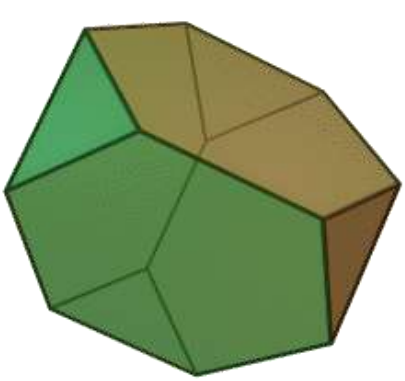
B. Beshburchaklik

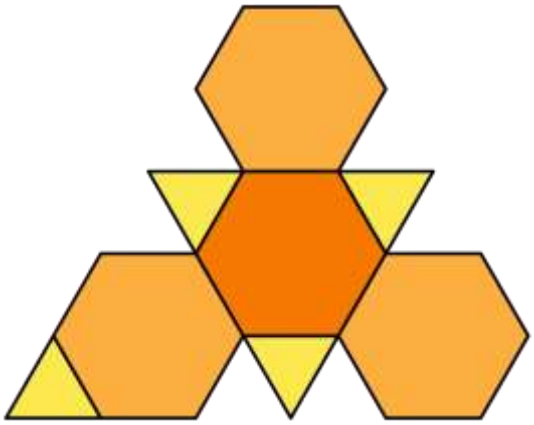
D. To‘rtburrchaklik

E. Yettiburchaklik

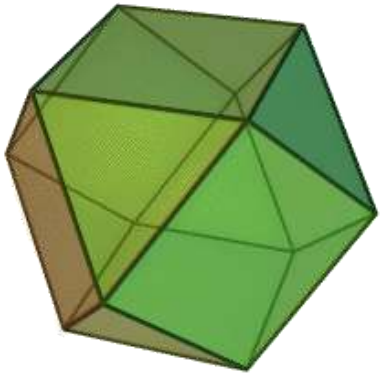
**NAMUNA**

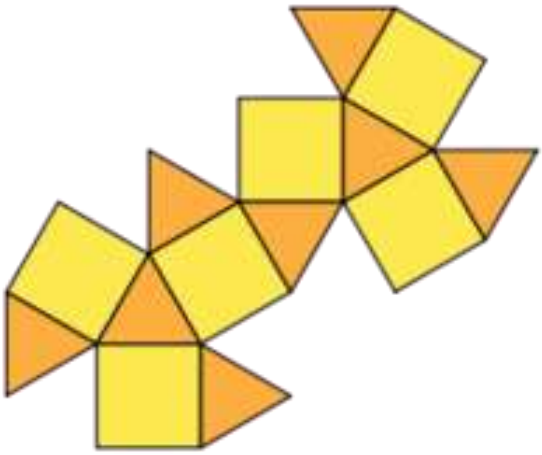
## Kesilgan tetraedr



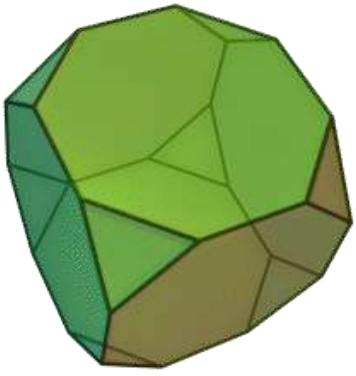


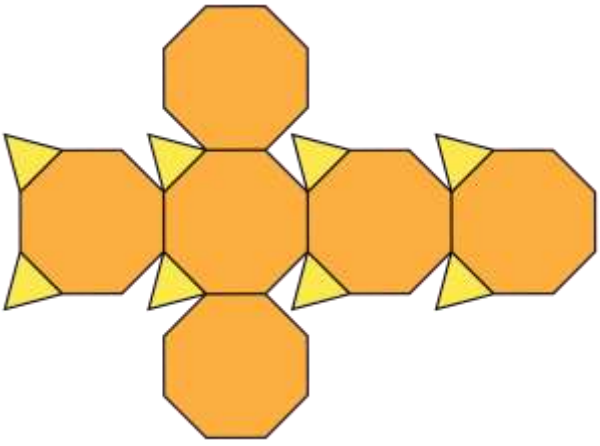
**Kubik taedron**

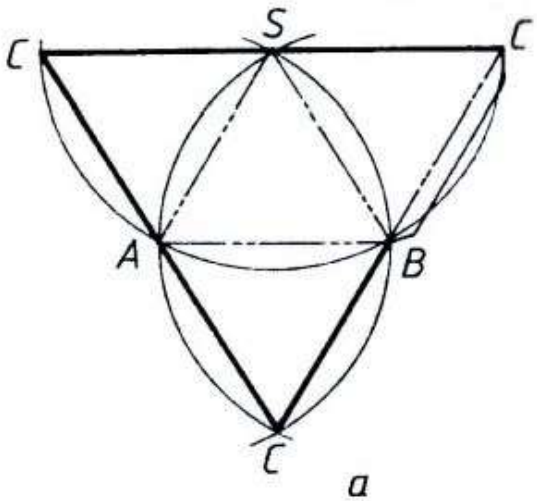




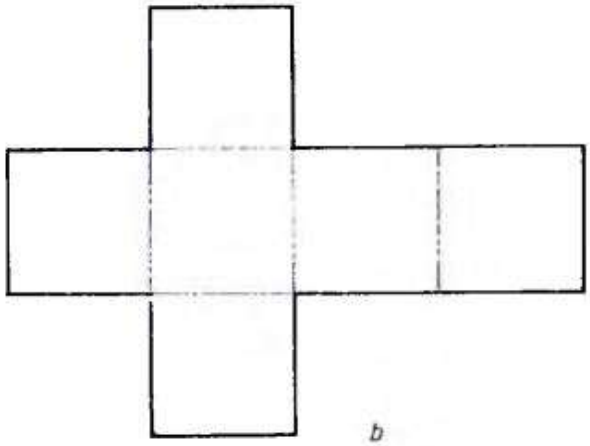
**Kesilgan kub**



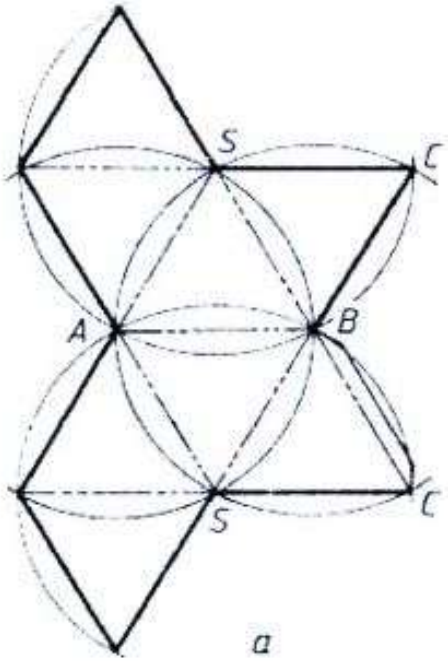




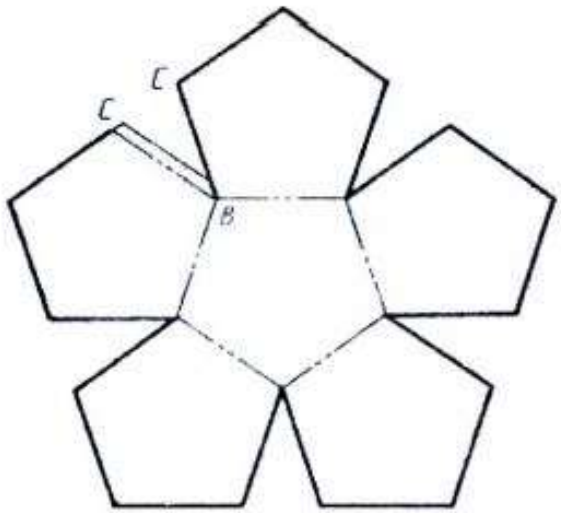

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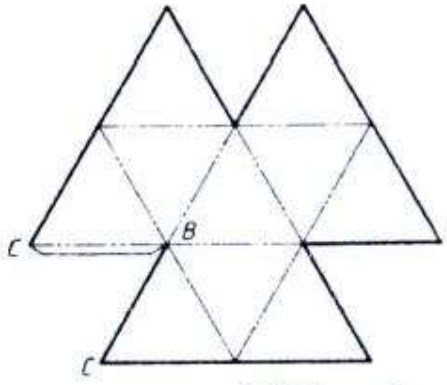
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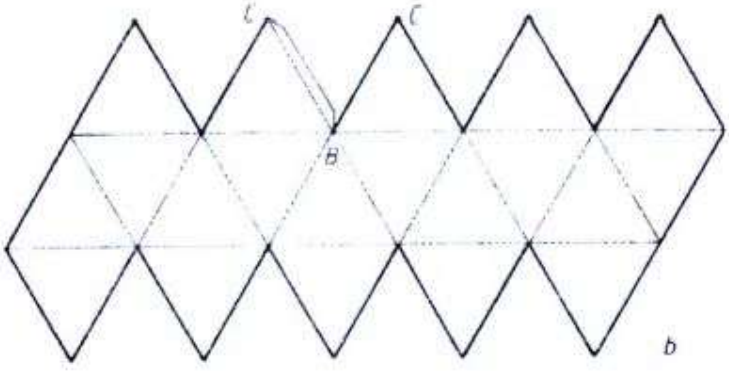

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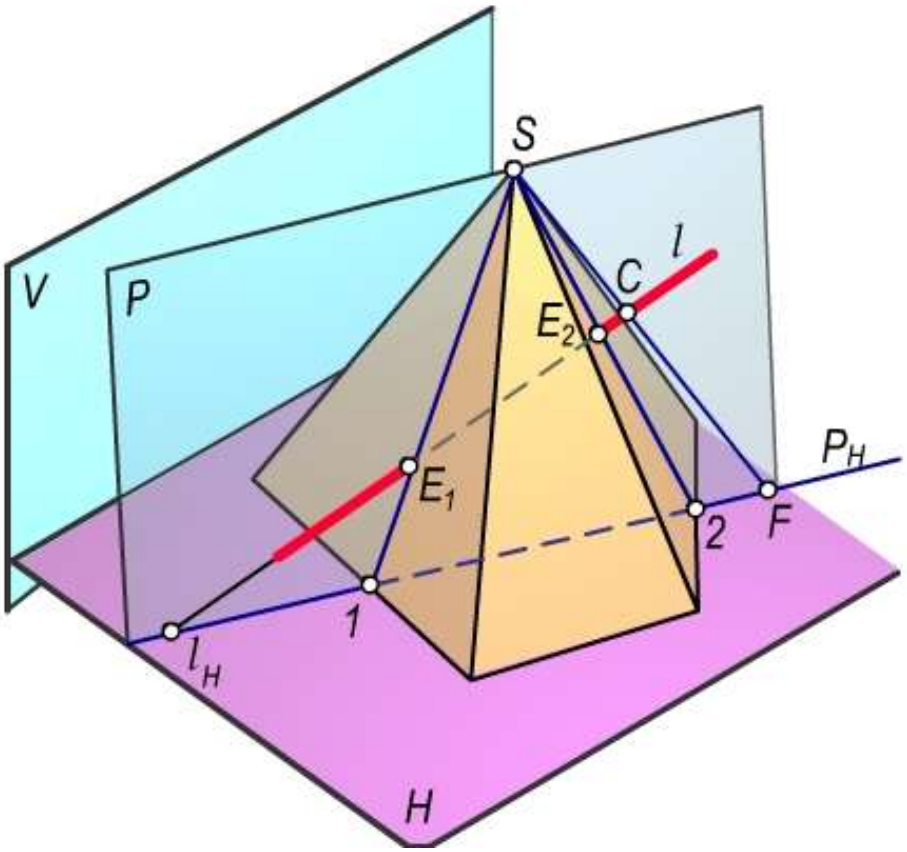

2 dona b

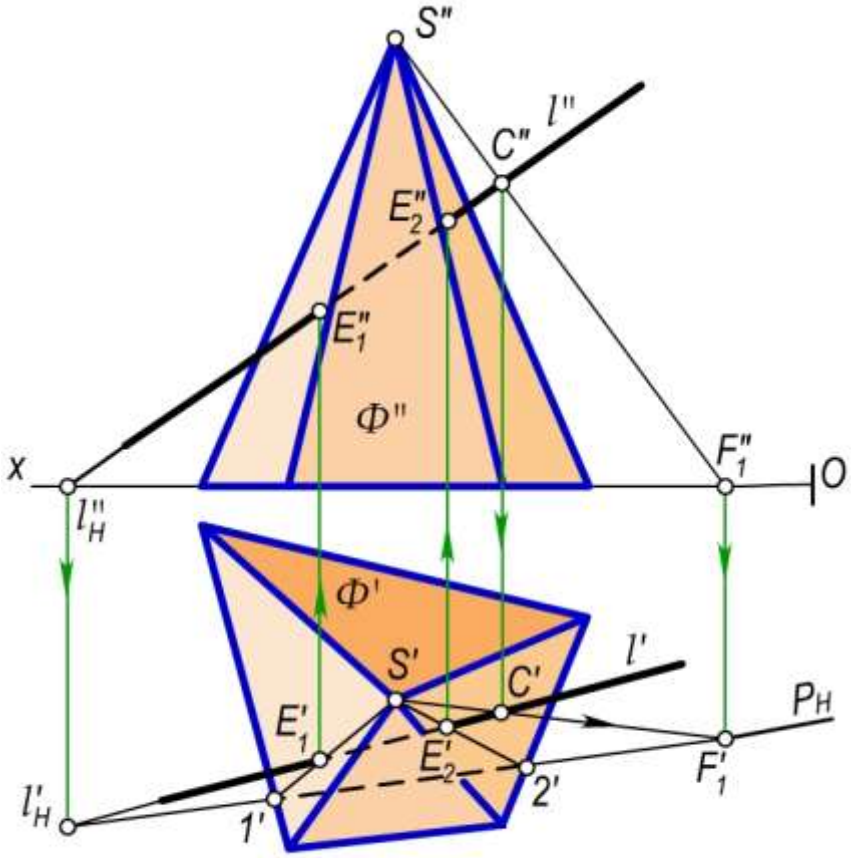


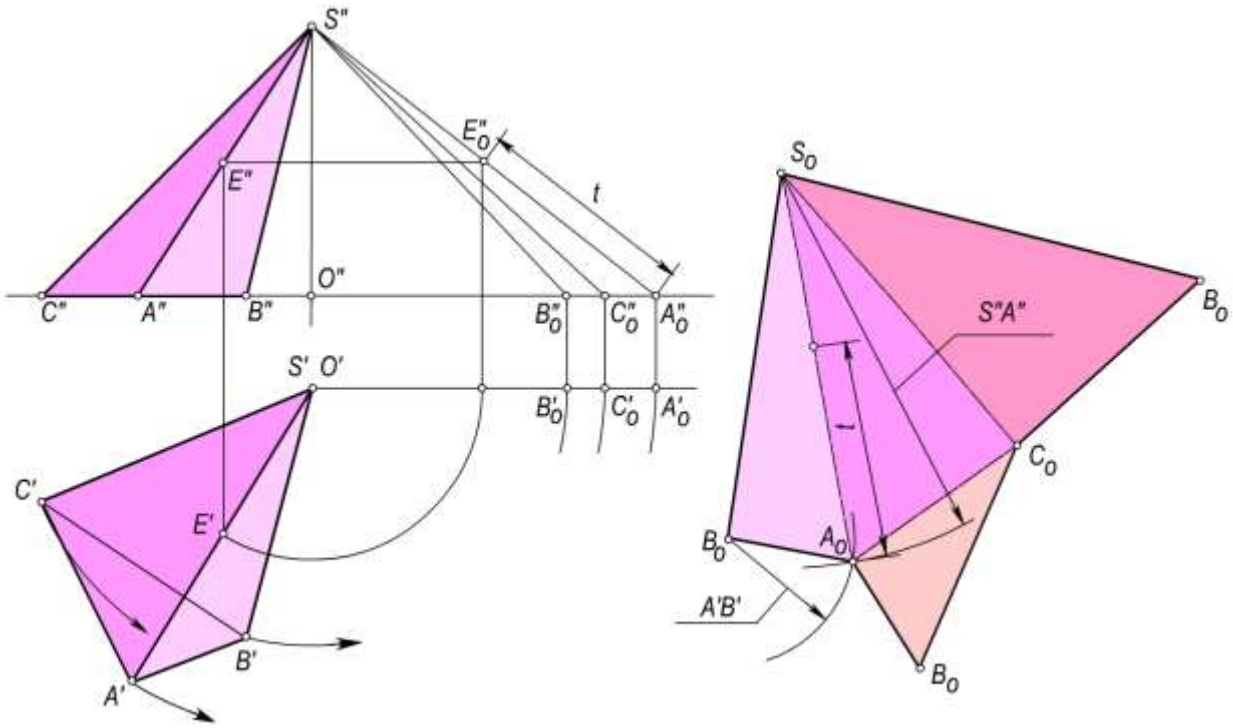

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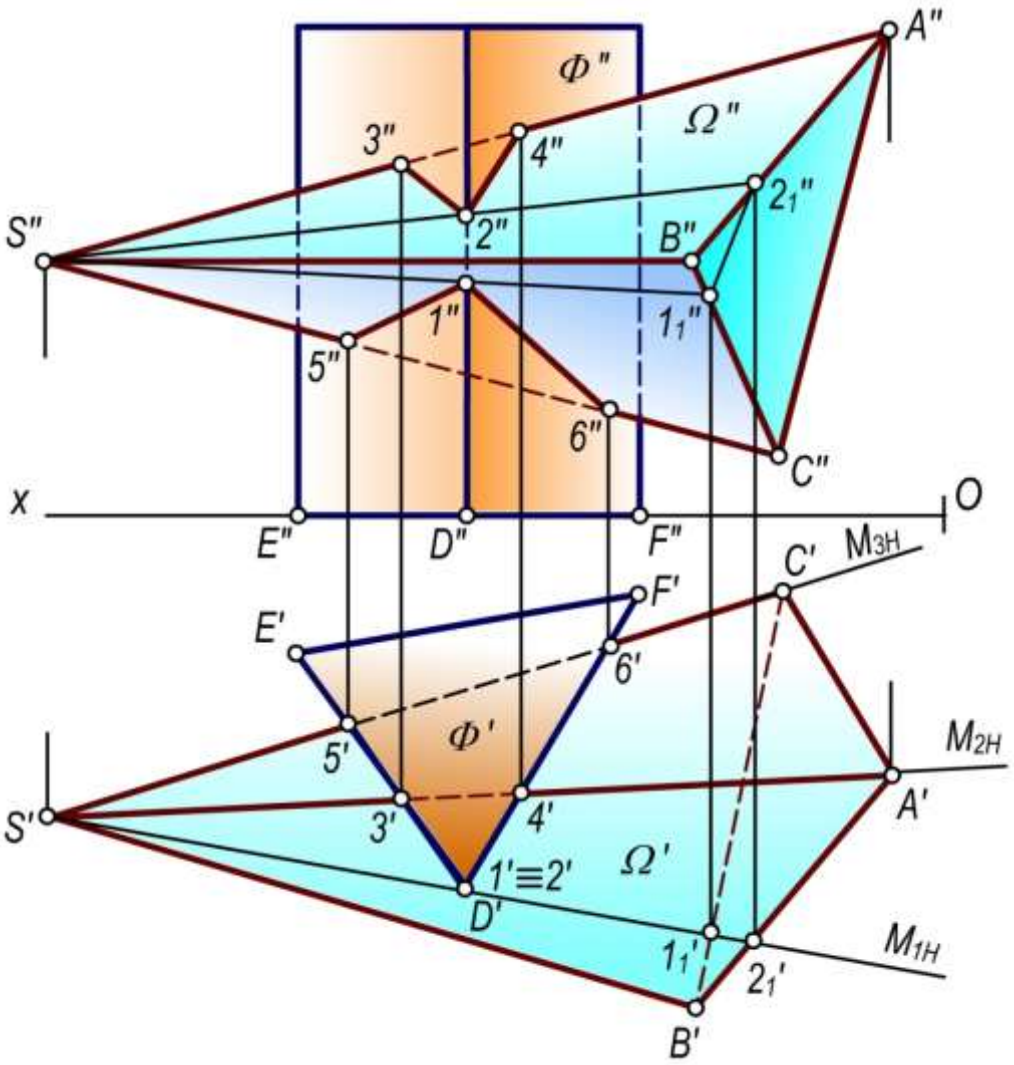



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