AJEMA GLOBAL RESEARCH NETWORK

AMERICAN Journal of Engineering, Mechanics and Architecture
Volume 02, Issue 03, 2024 ISSN (E): 2993-2637

Of Surfaces Harvest to Be and Theirs Straight as Given on The Drawing

KhojamovZiyovuddinSafarovich
Samarkand State University of Architecture and Construction named after Mirzo Ulugbek
Senior teacher of the "Architecture" department

Abstract.*This article explores the continued popularity and robust capabilities of AutoCAD, the widely used drafting software. Highlighting its automated features and diverse language support, the text highlights the utility of the program for designers, engineers, scientists, and students in a variety of fields. Emphasizing the importance of mastering basic drawing and graphic commands, the text shows how AutoCAD enables users to create complex designs with precision and efficiency. It also addresses the role of computer graphics in teaching practical skills, including the creation of surfaces through the movement and intersection of lines. Overall, the text serves as an informative reflection on contemporary design practices and the importance of AutoCAD in education.*

Keywords:*AutoCAD, design software, engineering, computer-aided design, graphics commands, drafting primitives, automation, accuracy, versatility, efficiency*

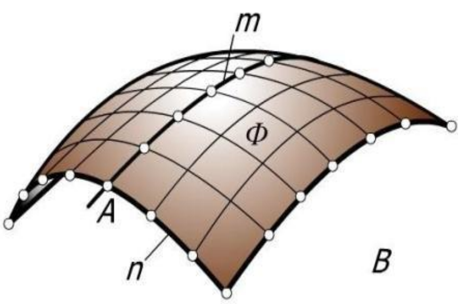
Introduction. Despite being almost 30 years old, AutoCAD is still popular among graphics software. Because the AutoCAD program is perfect and popular, and it is an automated program for designing works, which makes all types of schemes and drawings with high accuracy and quality. Also, to fully realize the creative potential of users of this program help will give. That's it because of millions designer experts, scientists, engineers and technicians and students, that is, more than 80 countries of the world, it has become normal for them to use the AutoCAD system for designing in 18 languages. AutoCAD program was created in 1982 and its millions foy gardeners to be despite In the Republic school students and studentsIn the process of studying "Informatics" and "Drawing" subjects, they learn to use graphic programs "Paint", "Risovanie" of "Microsoft Office Word" and graphic editing of "Baysik" program. However, in such graphic programs, the possibilities of automating graphic creation are low and almost non-existent. This article is a graphic program for the automation of design work, getting acquainted with the capabilities of the AutoCAD system, and even at school, in classes such as drawing and painting, with the help of graphic commands, the elements of drawing primitives, that is, drawings of their components 1-2-3 and 4- having learned to perform in training, based on the acquired knowledge, skills and practical skills, they can perform the 1st graphic task - "Connection".

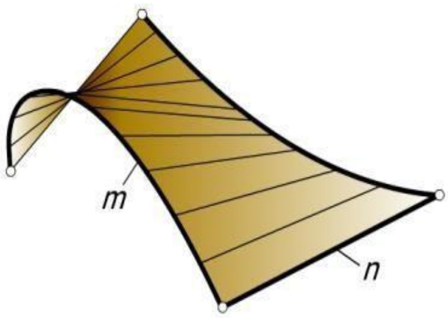
In the AutoCAD system, elements of graphic information, using a package of ready-made commands corresponding to them, enter the given dimensions into the computer, and images are executed based on the sequence of direct dialogues. When choosing topics for engineering computer graphics classes students drawing primitives on the computer to perform from teaching start,was determined to be appropriate. Because students who have mastered drawing primitives on a computer, can also make images of any complexity on a computer. It is known that a lot of modern literature on the AutoCAD system has been created. First, they were printed in a very large volume, consisting of at least 400-450 pages, and those that have reached us written in Russian. Such use of textbooks by pupils and students very is also inconvenient. The AutoCAD program manual is also written in Russian or English. It is known that any graphic information consists of points, sections, straight lines, polygons, circles, arcs and a set of curves made in different ways. These primitives can be painted, typed, enlarged, circled, deleted, moved, enlarged or axisymmetric. make a picture text writing, sizing and The aim is to teach practical use of commands such as editing a completed drawing and written text, including improving the skills of drawing on a computer. The science of computer graphics is taught using the following technical and software tools: Surfaces are formed as a result of continuous movement of a line in space . There are different ways of creating surfaces .

A curve *m and* a curve *n* crossing it at point A *are given in space (Fig* . 1). If *n* curves *m* curve line thus continuously if moved his series of situations from the t o' plant a surface consisting of In this case *m on the surface* curve line of the surface guide, *n* curve line its creator that is called Vice versa, *n* curve the line guide, *m* curve the line maker as can also be accepted. In this case, *the m* curve is moved along the *n curve.*

Depending on the type of generators, the surface created by a curved generator is called ***a curved surface*** (Fig. 1), and the surface created by a straight generator is called a ***linear surface*** (Fig. 2).

Optional the surface continuously to move as a result too surface harvest to do possible In this harvest was □ surface is movable □ $_1$ in each case of the generating surface has at least one common *n with it* will have a line. For example, if the center of a sphere with a constant radius R (Fig. 3) is continuously moved along a straight line, ***the surface of a circular cylinder*** □ is formed.





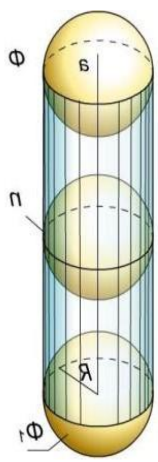


Figure 1 **Figure 2** **Figure 3**

A surface builder may or may not continuously change its shape during movement. Surfaces are divided into legal and illegal surfaces depending on the formation process. If the formation of a surface is based on a mathematical law, such a surface is called a legal surface. Circular cylinder, cone, second-order sphere, etc. surfaces are examples of this. The moving line is the creator of the surface, and the fixed straight line is called its axis of rotation. The generator and the axis of rotation form the determinants of the surface of revolution. In Fig. 4, the surface of general appearance formed by the rotation of the curve m(m′, m″) around the axis of rotation i(i′, i″) is depicted in a flat drawing. If the generator and axis of rotation are known, the surface of rotation is completegiven is considered of the surface to be given his determiners through □**(m,** ***i*****)**in the form of can be written .

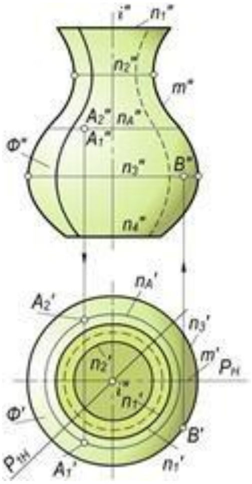
Flat in the drawing rotation surface, **′(m′,*i*′)** and **(m″, *i*″)** projections with and of determinersgiven by any two projections. In the process of rotation, all points of the generator move in circles, and these circles are called *parallels of the surface* . All planes passing through the axis of rotation are called *meridian planes,* and their lines of intersection with the surface of rotation are called *meridians of the surface* . All meridians of the surface are congruent. The frontal meridian plane is considered *the main meridian plane* , and its intersection with the surface is called *the main meridian line or the frontal outline* of the surface . Since the axis of rotation of the rotating surface in the general view of Fig. 6.10 is perpendicular to the plane of horizontal projections N, the frontal projections of the parallels on the surface (**n_1″ , n_2″ , n_3″ ,….)** have a straight line section in the form, and horizontal projections are depicted in real size, that is, in the form of a circle. Meridian sections formed by simple meridian planes ***P* (P_H)** and ***P_1* (P_{1H})** are shown in the flat drawing . Chief since the meridian is parallel to **V , its frontal projection** is equal to its real size .

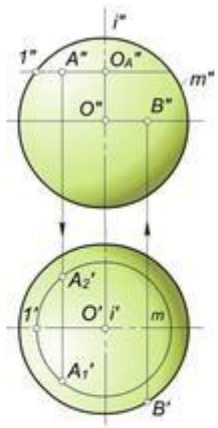
If the attempt transferred from the point of intersection of the parallel with the prime meridian to the prime meridian is parallel to the axis of rotation, this parallel is called *the equator or the meridian* . This is a parallel two-yen neighbor from parallels big if *equator,* if of them small if *since line* is called Therefore, a surface of rotation can have several equators and meridians. The rotation in Figure 6.10 is at the surface from parallels n_2 (n_2′,n_2″) since n_3 (n_3′,n_3″) while the equator

Figure 4 **Figure 5**

line is considered Other surfaces Similarly, the surface of rotation consists of an infinite number of points. These points cannot be depicted in a complete straight line.

That is why test cylinders are transferred to the surface of rotation perpendicular to **H** and **V.** The





line of intersection of the test cylinders with N is called ***the horizontal outline of the surface, and*** the line of intersection with V is called its **frontal *outline*** . Surfaces of rotation, most often, have their own horizontal and frontal outlines with is described. in Fig. 5 rotation of the surface frontal essay head meridian **m** ″ and **n** $_1$ ″ **,**With parallels **n 4 ″, the horizontal outline is described by parallels n** $_2$ ′ and **n** $_3$ ′.

Horizontal and frontal outlines also help to identify visible and invisible parts of surface projections.

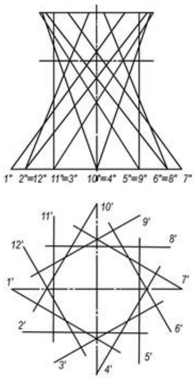
Projections of points on the surface are found using parallels. For example, ***A*** 1 belongs to the surface of rotation and ***A*** $_2$of points frontal projections ***A*** $_1$ ″ and ***A*** $_2$ ″ of Figure 6.10 is horizontal projections ***A*** $_1$ ′ and ***A*** $_2$ ″ **n** $_A$horizontal projection of the parallel **n** ′ $_A$defined in

horizontal projection *B ′ of the point B* lying on the equator is given. Its frontal projection *B* ″ is in the frontal projection **n 3 ″ of the equator.**

Rotating surfaces are widely used in engineering and construction practice. Because most mechanisms are rotary, and turning surfaces are easily machined.of the surface the most big parallel his ***equator*** and the most small parallel his ***neck*** is called

Depending on the function of the machine mechanisms to be designed, the technical requirements and shape, the manufacturer of the rotating surface is selected.

Any three straight lines belonging to the same family can be taken as surface guides. It is written in the form of (***a, b, c)*** with surface identifiers . Figure 6 shows a one-section hyperboloid in a plane drawing with its straight line components belonging to two families. Academician VGShukhov (1853-1939) first recommended the use of the properties of these surface builders in construction techniques. A single-phase rotating hyperboloid was used in the construction of structures such as a radio mast and a water tower. These constructions are widely used in the construction industry due to their strength and lightness. In 1921, a 160-meter 6-section (6 hyperboloid) radio mast was built in Moscow based on the project of VGShukhov (Fig. 7). Nowadays, this surface is widely used in construction practice.



Figur6

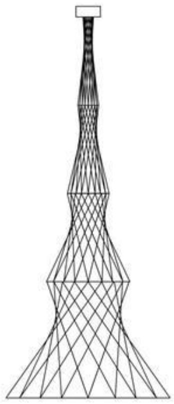


Figure 7

References

1. Harvey Willard Miller. Descriptive Geometry. London, 2013.-149 pages
2. William Griswold Smith. Practical Descriptive Geometry. London 2013.-257 pages.
3. Azimov TD Drawing, text of lectures on geometry. Study guide. - T.: TDTU, 2005.- 228 p.
4. Azimov TD Drawing geometry. Education manual. - T.: TDTU, 2005.-228 b.
5. Azimov T.D. Nachertatel'naya geometry. Uchebnoeposobiya T.; TGTU, 2011.-167 c

6. Muradov Sh and others. Drawing geometry. High study countries for textbook –T: "Teacher", 2008-. 260 p.
7. Sabirova DU Drawing geometry and engineering graphics. Study guide. - T.: TDTU, 2011- 140 p.
8. L. Heifetz "Ingenernaya." computer graphic» SPB: BXB.-Petersburg.: 2005.
9. Alimova D.K. Nacheltatel'naya geometry and engineering graphics. -T: Izd-vo "Science and Technology", 2016

Alimova DK, Karimova VN, Azimov AT. Drawing geometry textbook for technical universities. -T,: "Barkamolfayz media", 2018 -173- b