# MAHATMA GANDHI COLLEGE, IRITTY

**(Re accredited by NAAC with A Grade)**

**Keezhurkunnu, Keezhur PO, Kannur Dt., Kerala – 670 703**

# LaTeX and GeoGebra

The Department of Mathematics, Mahatma Gandhi College, Iritty started a **Certificate Course in 'Latex and GeoGebra'** There will be 30 hours of contact classes (including practical). A maximum of 25 students will be admitted to the course. There will be a practical exam (for 20 marks). Grade certificates will be issued to students who submit assignments in both LaTeX and GeoGebra and get more than 40% marks in the practical exam. Course will start from January 2023 and come to an end by May 2023.

## COURSE OUTCOMES

| | |
|---|---|
| CO1 | Learn installation of the software |
| CO2 | Understand the use of LateX in typesetting |
| CO3 | Learn basic structure of a LateX document |
| CO4 | Understand the preamble of a document |
| CO5 | Learn to include Title, Author, Date and Comments |
| CO6 | Learn to bold, italics and underlining a content |
| CO7 | Learn to add images, captions, creating list and tables |
| CO8 | Understand different Mathematics environment and Learn to write mathematical expressions using different commands |
| CO9 | Understand different types of packages |
| CO10 | Learn to create a simple letter, research article or question paper using LaTex |
| CO11 | Familiarizing GeoGebra |

Link for joining classroom https://classroom.google.com/c/NTEzNDM5MTA1MDU2?cjc=4hj7npz

We expect sincere cooperation and whole hearted support from the faculty and students in Mathematics fraternity.

Thanking you,

With regards,

| | |
|---|---|
| **Jimly Manuel** | **Dr Bijumon R** |
| Conveners | Head, PG Dept of Mathematics |

*Faculty Members:*

**Haseena C, Priyanka P, Vidya T.M., Maya P V,**

| | |
|---|---|
| **Aneesh Kumar K** | **Dr Swarupa R** |
| Convener, IQAC | Principal |

Email: **maths.mgc1@gmail.com**

PG DEPARTMENT OF MATHEMATICS

**MAHATMA GANDHI COLLEGE, IRITTY**

**Re-Accredited by NAAC with A Grade**

**(Aided and Affiliated to Kannur University)**

email: maths.mgc1@gmail.com

# CERTIFICATE COURSE IN

# "LaTeX and GeoGebra" (CCMATLG)

## SYLLABUS w.e.f. 2021

| Course Code | Theory | Practical | Marks | | |
|---|---|---|---|---|---|
| | | | External | Internal | Total |
| CCMATLG | 12Hrs | 18 Hrs | 40 | 10 | 50 |

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**Module 1 -** What is LaTex?, Why learn LaTex?. Writing your first piece of LateX. The preamble of a document. Including title, author and date information. Adding comments.

Bold, Italics and underlining. Adding Images. Captions, Labels and references. Creating list in LateX. Adding math to LateX. Different packages.

**(10 Hours)**

**Module 2** –. Basic document structure. Abstract. Paragraphs and new lines. Chapters and sections. Creating tables. Adding boarders. Adding table of contents.

**(10 Hours)**

**Module 3 -** Familiarizing with GeoGebra tools , Relation with Algebra and Geometry (Giving algebraic input and getting geometric output ),Creation of three dimensional geometrical objects ,Matrix Theory with the help of GeoGebra.

**(10 Hours)**

**Practical Work**:

1. Prepare an article on some MSc topic(Not more than 5 pages)
2. Construction of an equilateral triangle with given sides Fifis
3. Construction of cylinders, spheres of given measurements.
4. Finding eigen values and eigen vectors of given matrix.
5. Locating points and finding position vectors.

## References:


1. 'LaTex beginners Guide', 2nd Edition, Steffan Kotwitz, 2021.
2. 'More Math into LaTex', George Gratzer, 2007.
3. "An Introduction to GeoGebra", Steve Phelps
4. e-resources

**MAHATMA GANDHI COLLEGE, IRITTY**

**CERTIFICATE COURSE in**

**LaTeX and GeoGebra**

**2023-2024**

| Sl. No | Reg. No | Name | Class |
|---|---|---|---|
| 1 | CSPSMM1002 | Abhina P | I MSc Mathematics |
| 2 | CSPSMM1003 | Achu C | I MSc Mathematics |
| 3 | CSPSMM1004 | Aiswarya K | I MSc Mathematics |
| 4 | CSPSMM1005 | Alka Rajeev P. M. | I MSc Mathematics |
| 5 | CSPSMM1006 | Anusree T. V | I MSc Mathematics |
| 6 | CSPSMM1007 | Devananda K | I MSc Mathematics |
| 7 | CSPSMM1008 | Devika M | I MSc Mathematics |
| 8 | CSPSMM1009 | Fathimathul Fidha S | I MSc Mathematics |
| 9 | CSPSMM1010 | Hashana Hashim | I MSc Mathematics |
| 10 | CSPSMM1011 | Jumana Hasin K | I MSc Mathematics |
| 11 | CSPSMM1012 | Jwala M Jose | I MSc Mathematics |
| 12 | CSPSMM1013 | Keerthana P K | I MSc Mathematics |
| 13 | CSPSMM1014 | Lavanya U. K | I MSc Mathematics |
| 14 | CSPSMM1015 | Steffy Joseph | I MSc Mathematics |
| 15 | CSPSMM1016 | Vaishnavi K | I MSc Mathematics |
| 16 | CSPSMM1017 | Varsha K | I MSc Mathematics |
| 17 | CSPSMM1018 | Varsha P | I MSc Mathematics |

# MAHATMA GANDHI COLLEGE, IRITTY

Affiliated to Kannur University, Re-Accredited with A Grade by NAAC with CGPA 3.22
Kannur Dist-Kerala 670703

## Certificate of Completion

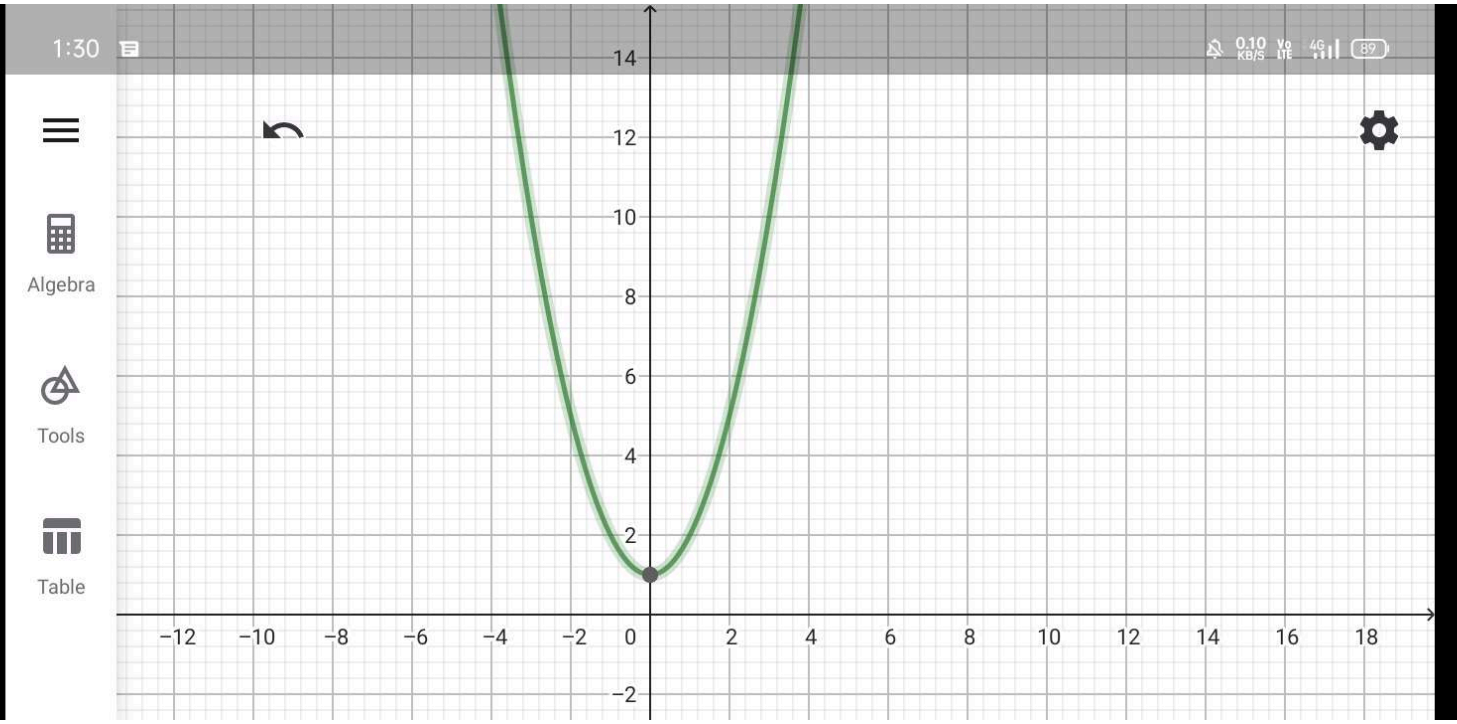
This is to certified that ..Abhina.P.....student of first year M.Sc. Mathematics successfully completed the certificate course in ***'LaTeX and GeoGebra'*** offered by P.G. Department of Mathematics in association with IQAC, Mahatma Gandhi College, Iritty in the academic year 2023-2024.

Jimly Manuel
Coordinator

Dr. Bijumon R
HOD

Dr. Aneesh Kumar K
IQAC Coordinator

Dr. Swarupa R
Principal


1:30
Algebra
Tools
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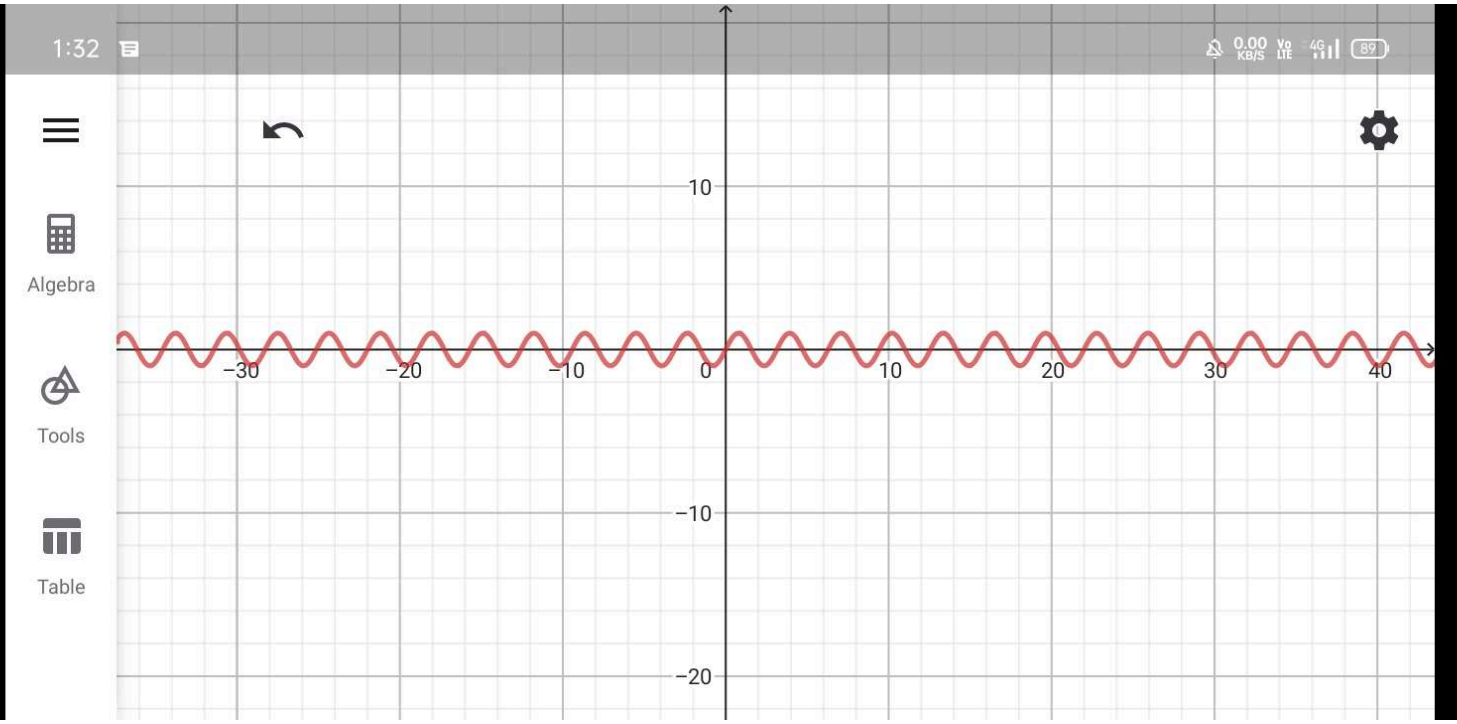
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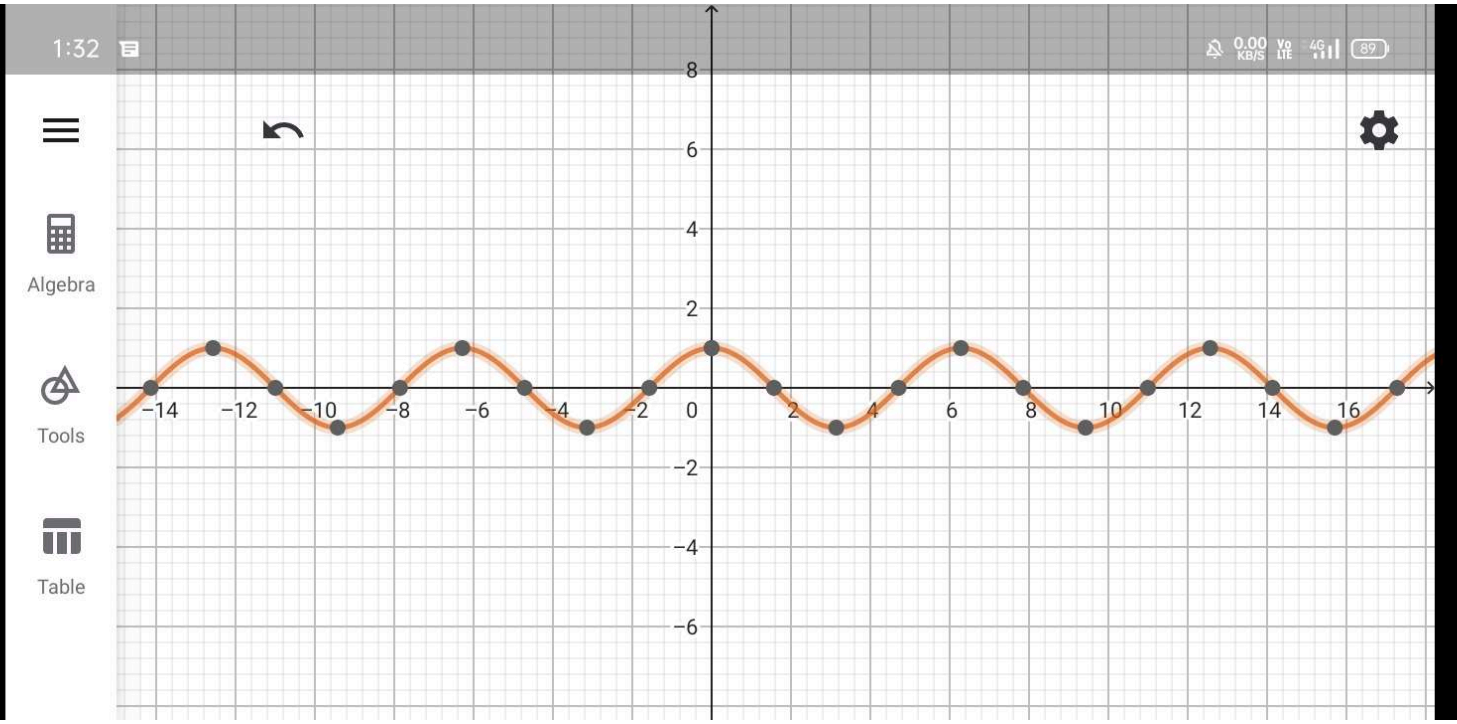
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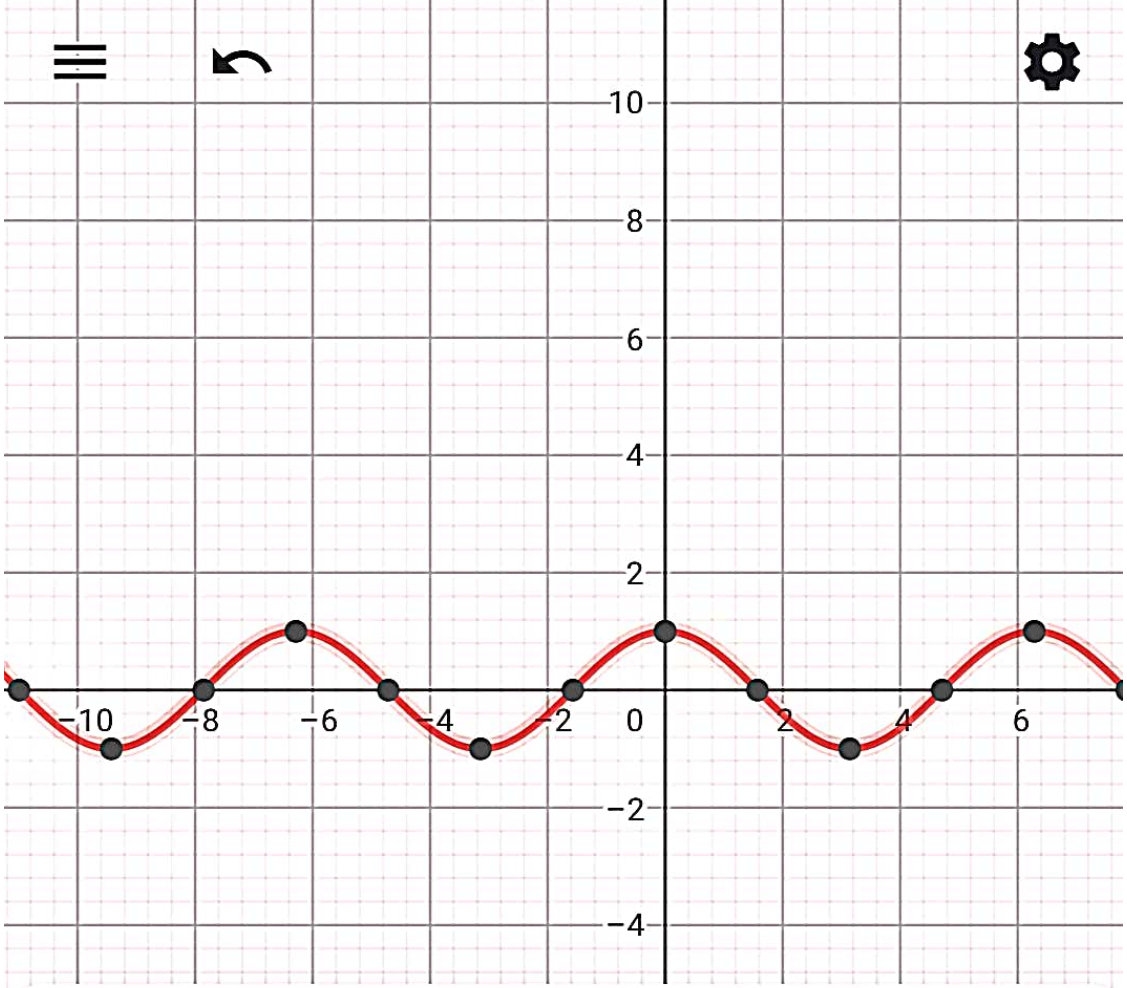
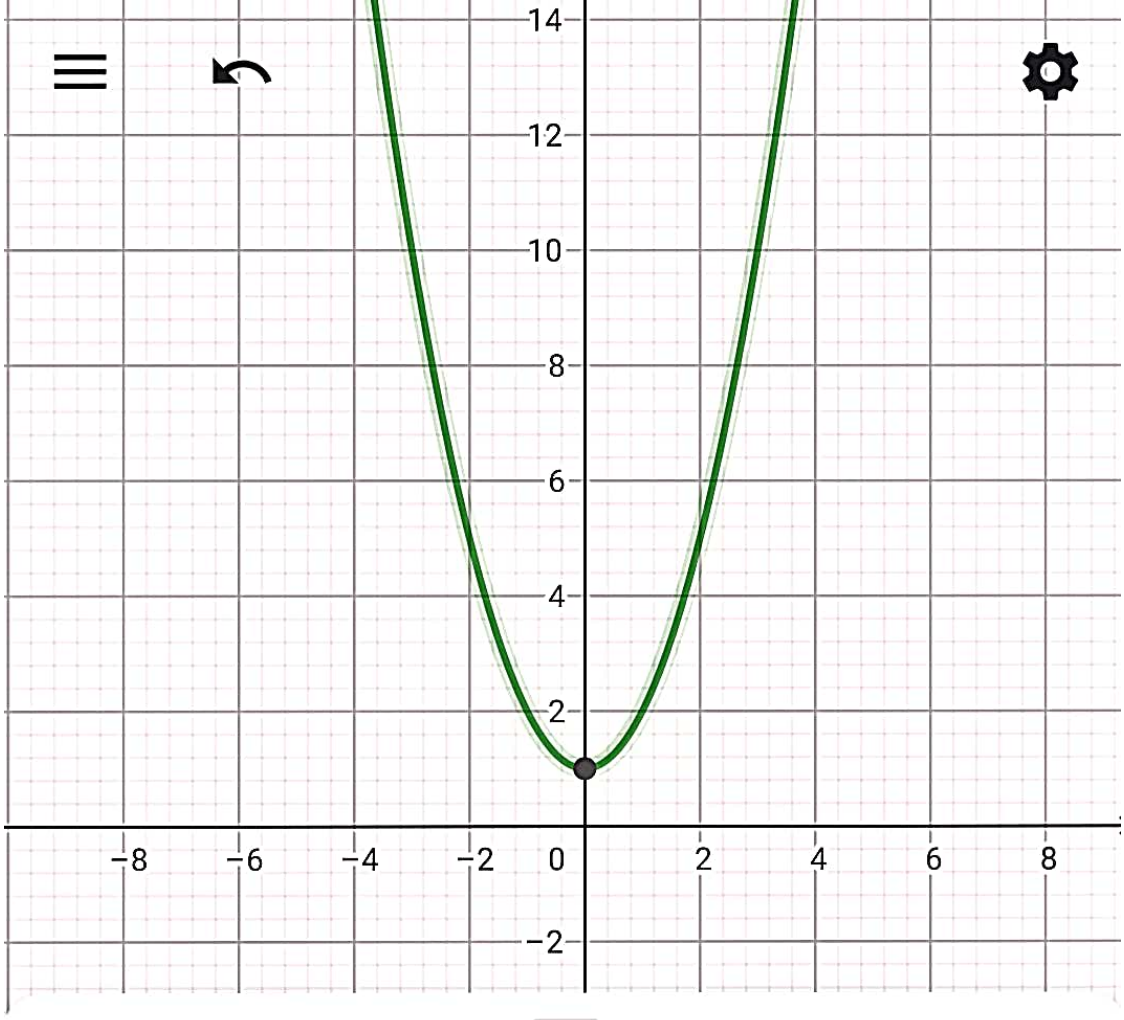



f(x) = cos(x)

Input...

GeoGebra Calculator Suite

Algebra Tools Table

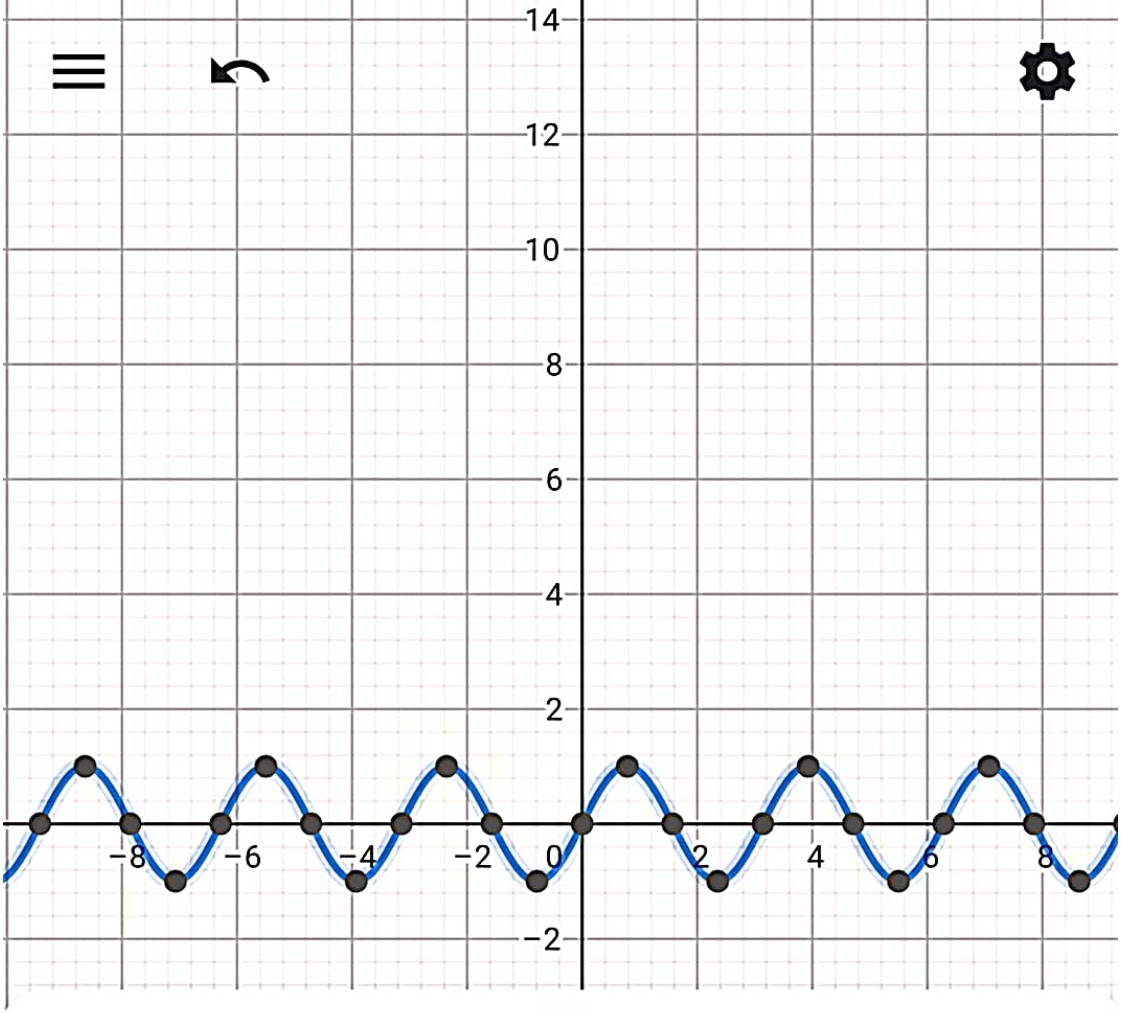



$f(x) = x^2 + 1$

Input...

GeoGebra Calculator Suite

Algebra Tools Table

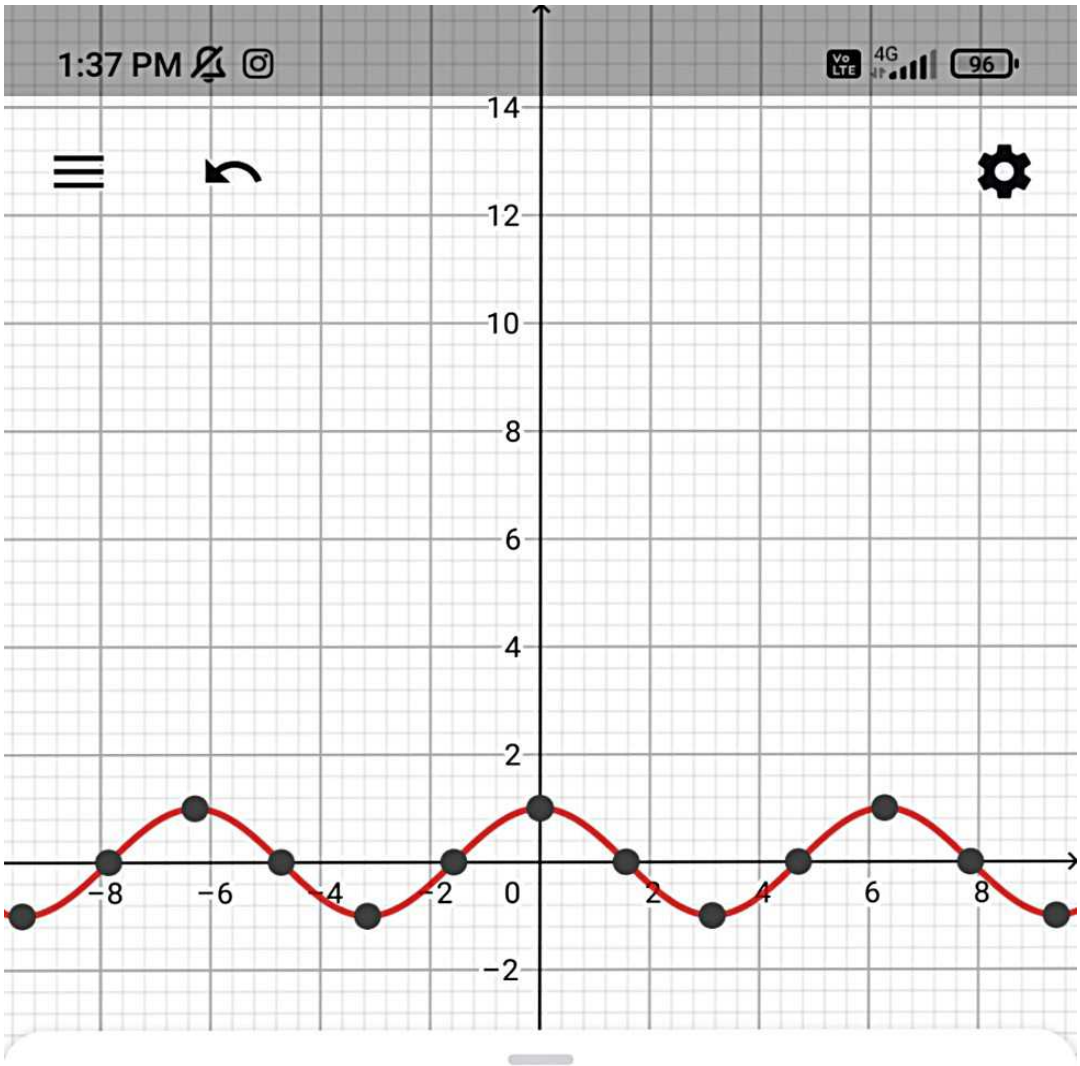



$f(x) = \sin(2x)$

Input...

GeoGebra Calculator Suite

Algebra Tools Table




cos(x)

123 f(x) abc #&¬

x y π e 7 8 9 × ÷

4 5 6 + -

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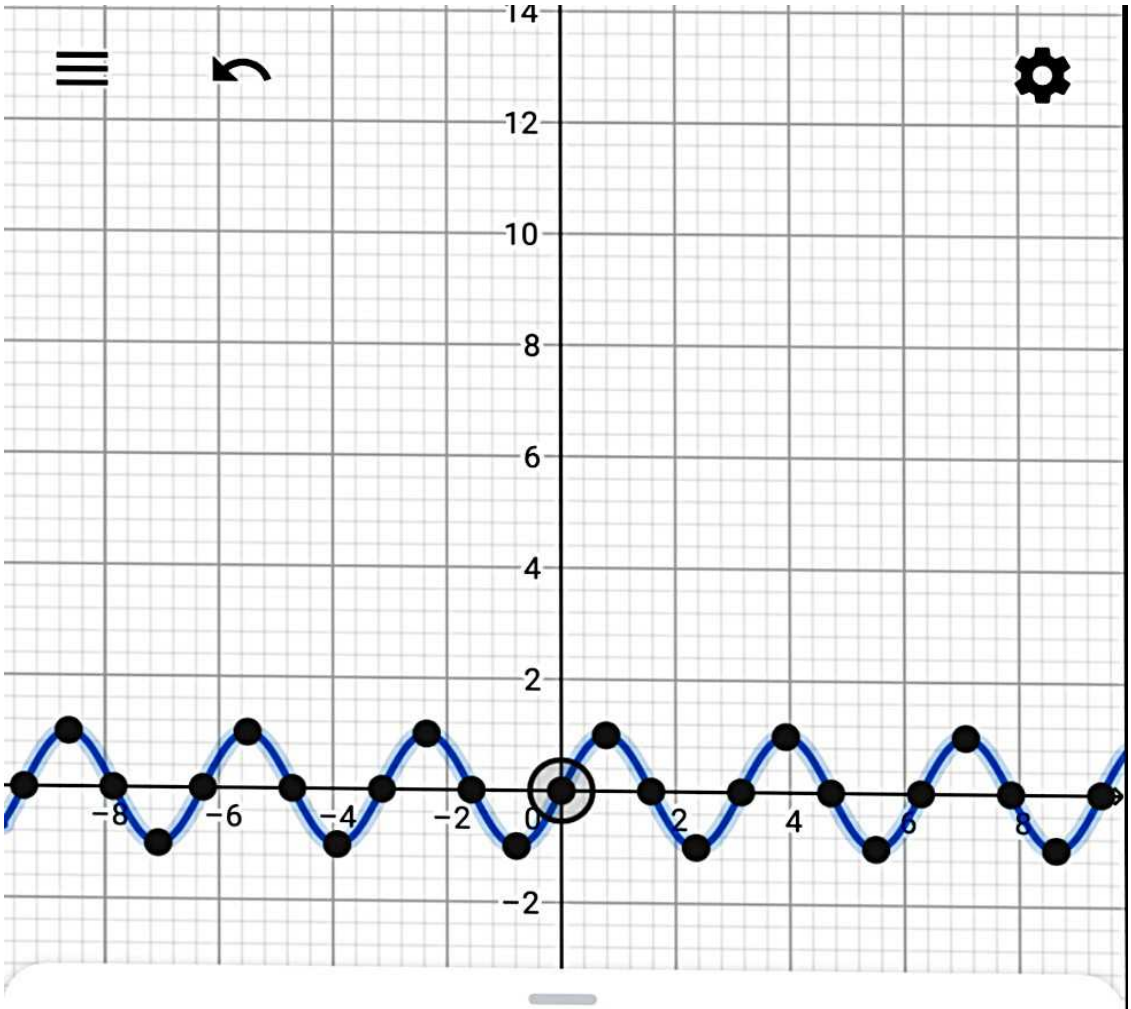



$f(x) = \sin(2x)$

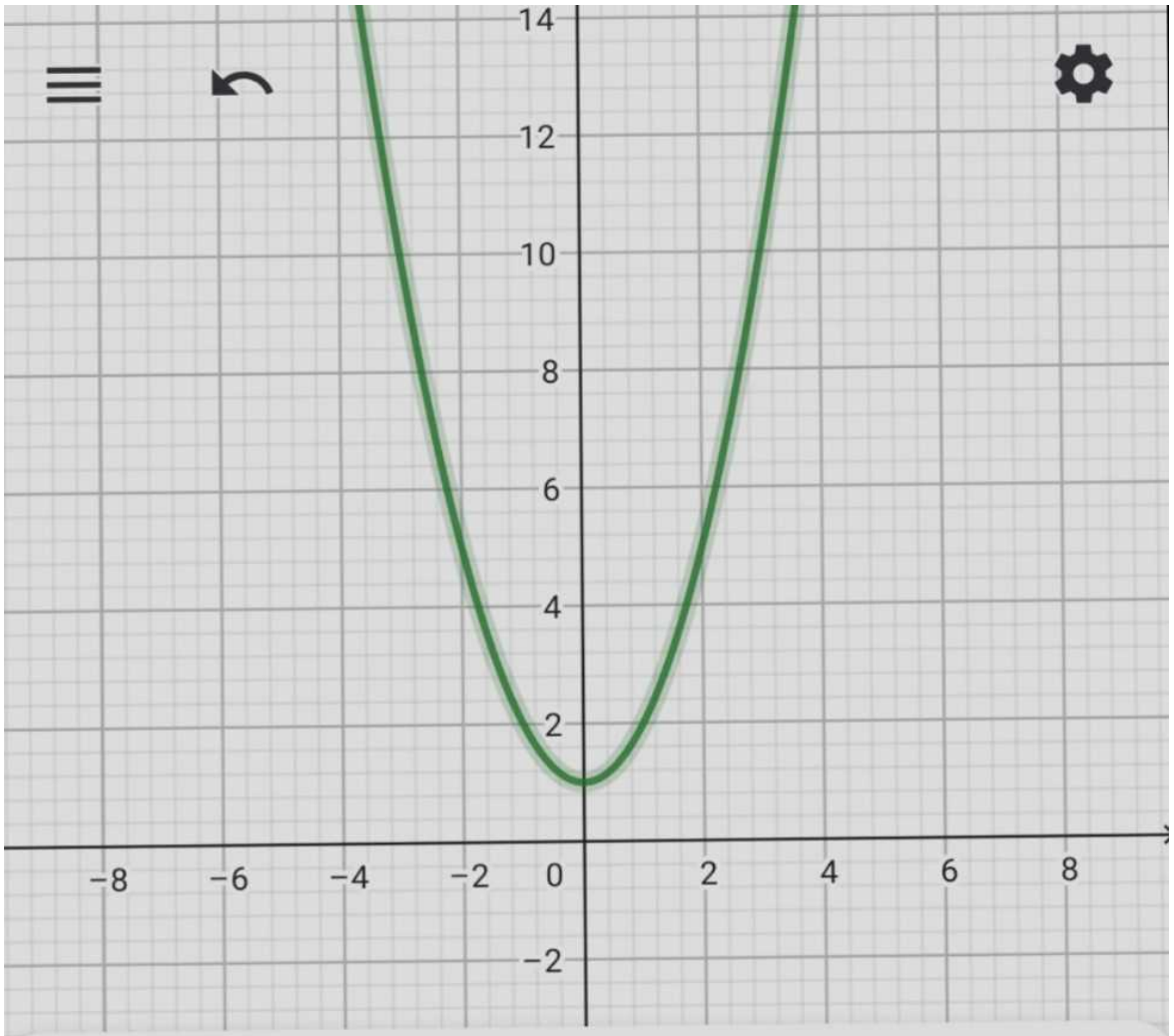
Input...

GeoGebra Graphing Calculator

Algebra

Tools

Table




$f(x) = x^2 + 1$

Input...

GeoGebra Graphing Calculator

# 2 Linear spaces and Linear maps

We introduce an algebraic structure on a set X and study functions on X which are well behaved with respect to this structure.

from now onwards **K** will denote either $\mathbb{R}$ , set of all real numbers or $\mathbb{C}$ , set of all complex numbers.For $k \in C$ $Re$ k and $Im$ k will denote the real and imaginary part of k.

A linear space(or a **Vector space**) over K is a non empty set X along with a function $+ : X \times X \to X$,called **addition** and a function $. : \mathbf{K} \times X \to X$ is called **scalar multiplication** such that for all $x, y, z \in X$ and $k, l \in \mathbf{K}$ we have

$$x + y = y + z$$
$$x + (y + z) = (x + y) + z$$
there exists $0 \in x$ such that $x + 0 = x$
there exists $\in x$ such that $x + (-x) = 0$

# 1 Linear Space and Linear Maps

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$$\text{there exist } 0 \in X \text{ such that } x + 0 =,$$
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# 03-ABHINA P

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today

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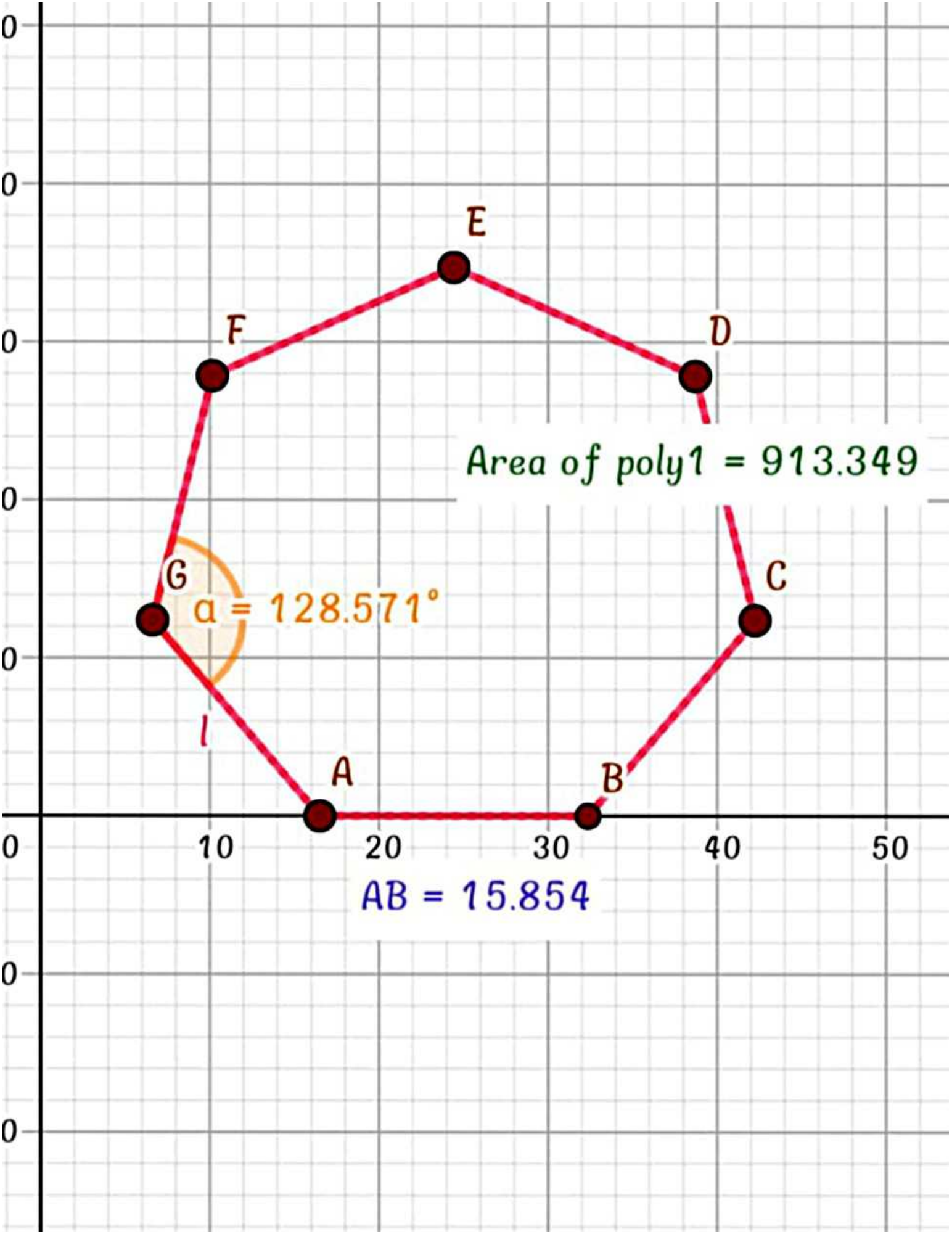
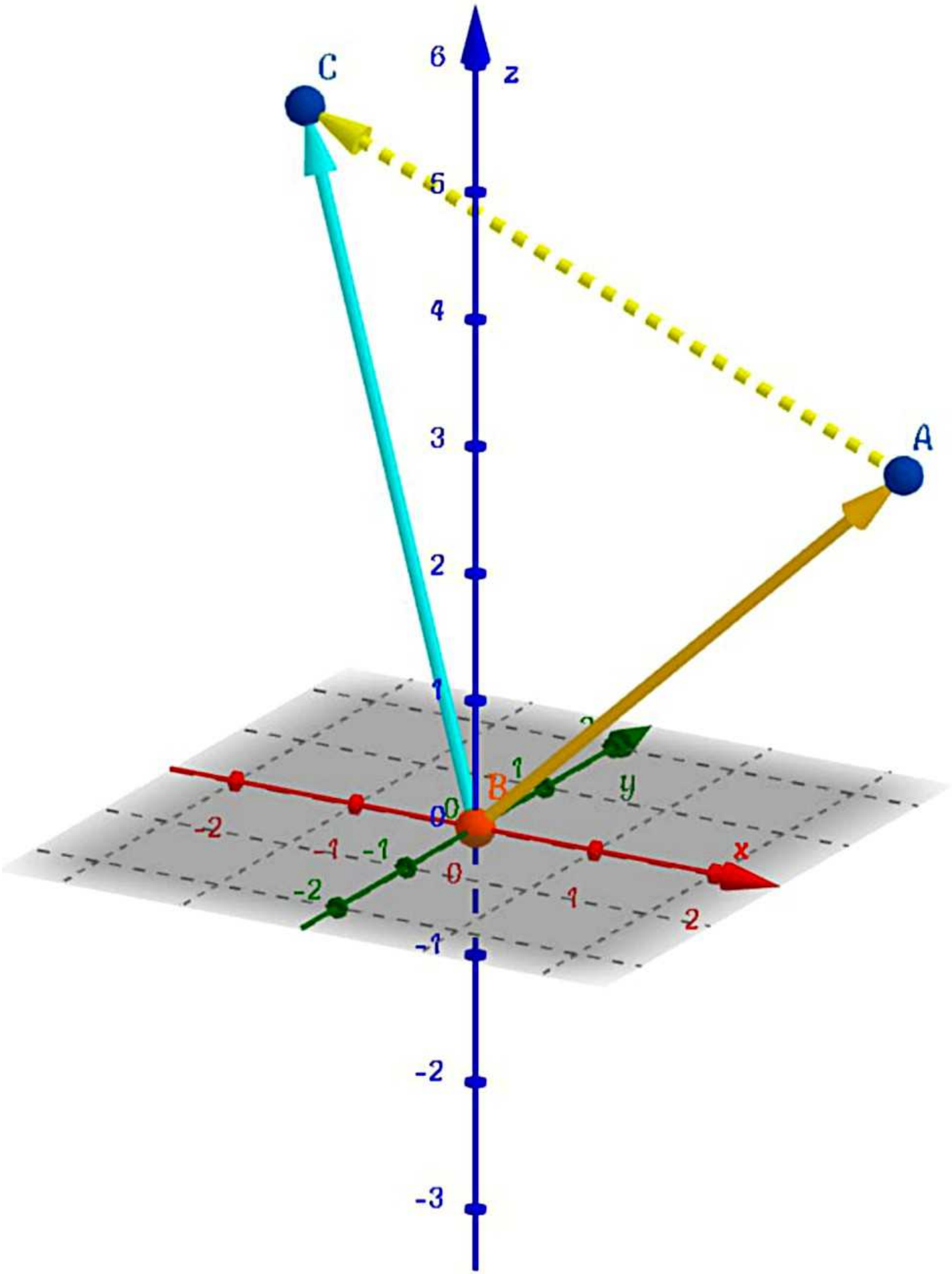

E
F
D
Area of poly1 = 913.349
G
α = 128.571°
C
l
A
B
10
20
30
40
50
AB = 15.854


C
z
6
5
4
3
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y
x
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-1
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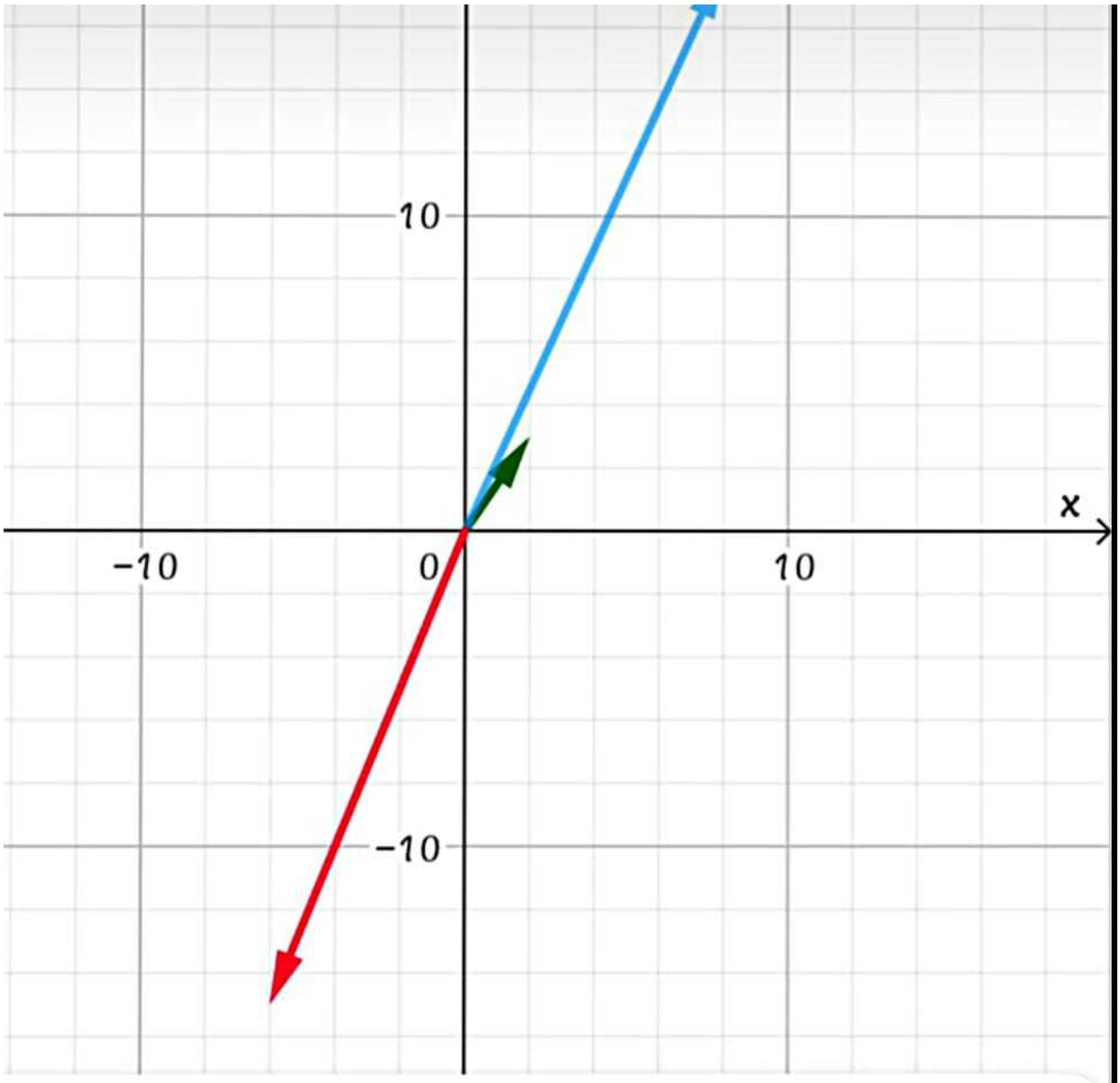
1
2



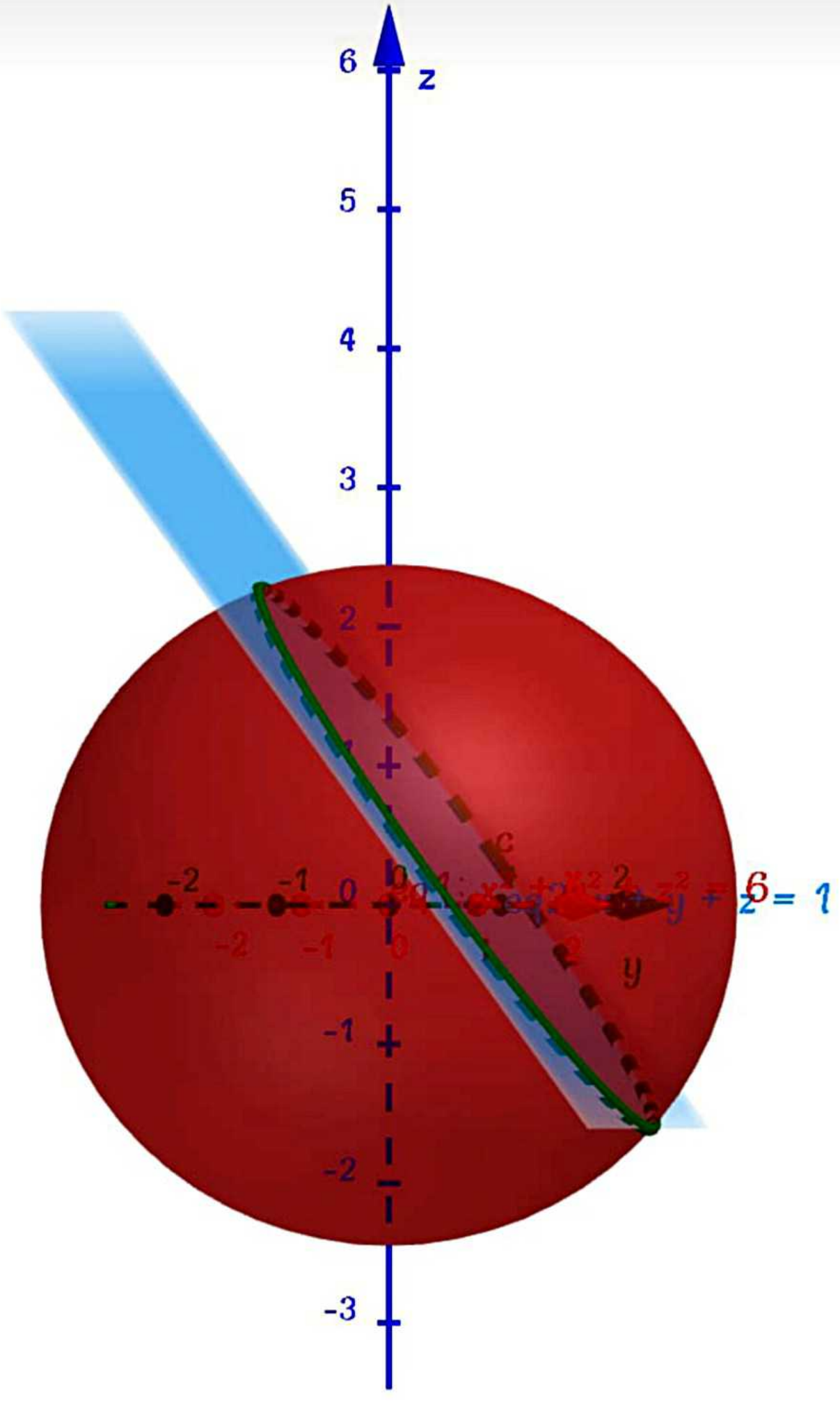

$$A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

$$x_0 = \text{Vector}(2, 3)$$

$$= \begin{pmatrix} 2 \\ 3 \end{pmatrix} \approx$$

$$x_1 = \text{Vector}(A\, x_0)$$

$$= \begin{pmatrix} 8 \\ 18 \end{pmatrix} \approx$$


z
6
5
4
3
2
-1
-2
-3
-2
-1
0
y
x + y + z = 1