

Florida GeoGebra Conference 2019
 Florida Atlantic University
 Pompano Beach Senior High School
 U.S.A.

Valerian Antohe @ **Mireca Crisnic**
 ROMANIA

"Ten Years With GeoGebra"
 A short review about GeoGebra



GGJRO
 GeoGebra Institute of Timisoara, Romania
 An invitation to a place full of GeoGebra application!

An invitation to a place full of GeoGebra application!

International Journal GGJRO

2009 The first local GeoGebra Institute, GeoGebra Institute of Timisoara, Romania was established and it gathered together a large community of science-teachers across Romania and from abroad

2010 The Journal GeoGebra The New Language For The Third Millennium, (GGJRO), was founded in 2010 as a part of research of the team of GeoGebra International Community. At that time, Markus and Zsolt appreciated:

"We are delighted that this book addresses such a wide range of developments in the GeoGebra community. Taken to the limit, not only descriptive statistics and research approaches of GeoGebra, from some new perspectives, but also on statistics that break with existing paradigms in the work of the community and on other authors to get from their own work and efforts."

Markus (Editor-in-Chief of GeoGebra, "Starting movements in GeoGebra: progress, challenges and prospects around the world", Vol. 1, No. 1, 2010)

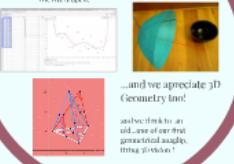
Perspective-GeoGebra-Innovation!

2009-2019
 Today, as math teacher or as teacher of science, we use GeoGebra software: to PERIOD, STATISTICS, BASIC REGRESSION, TABLES of INTEGRATION, GEOMETRY, KEYS! The list is long!

...and we appreciate 3D Geometry too!

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...and we appreciate 3D Geometry too!



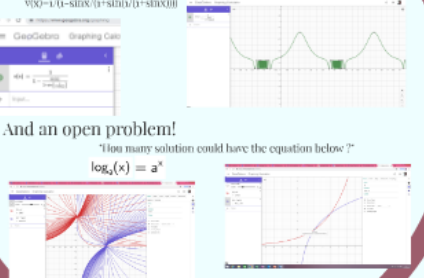
2019
 Classical problem:
 Real function graphic representation

**"Today we are still wondering:
 Which are the limits of GeoGebra in exploring graph of any real function?"**

$y = \sin(x) - \sin(x/2) + \sin(x/4) - \sin(x/8) + \dots$

And an open problem!
 "How many solution could have the equation below?"
 $\log_2(x) = a^x$


What about the intersection between red and blue curves?



GGJRO
 ISSN: 2068-3227
<http://ggjro.wordpress.com/>
 GGJRO-International GeoGebra Community



Imagine real function



GeoGebra Evolution

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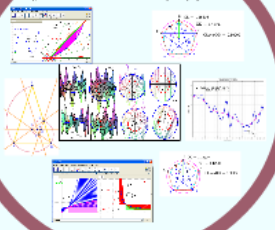
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2019 - GeoGebra procedure helps us today to construct the most appropriate real function which crosses through some points in the Cartesian plan and gives us a practical solution for one of the most interesting maths problem, "The Weierstrass Problem".

This is the Rainbow through the 10 years decade

Views, problems, exploring GeoGebra

Images which illustrate and transmit the complexity of GeoGebra



Thank you for your attention and support!
 See you with GeoGebra!

<http://www.geogebra.org/m>

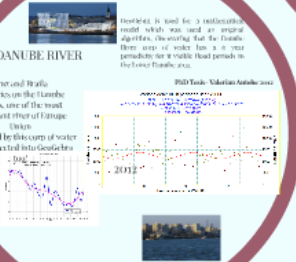
Linz-AUSTRIA

DANUBE RIVER

The small traffic on the Danube shores, one of the most important rivers of Europe

Links connected by this sort of water but connected by GeoGebra

Braila-ROMANIA



Weierstrass Problem

The Weierstrass problem is a classical problem in mathematics. It asks for a function that is continuous everywhere but differentiable nowhere. This is a very interesting problem because it shows that there are functions that are very "rough" and do not have a unique tangent line at any point.



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 8-9 MAI 2015
 BRAILA - ROMANIA



Brăila- ROMANIA
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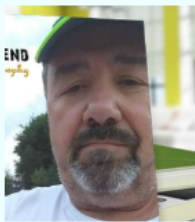
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Valerian Antohe & Mircea Crisnic
ROMANIA

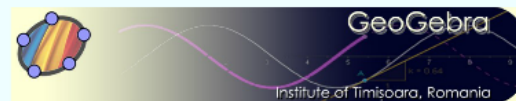


PhD Math Teacher
National College Nicolae Balcescu
Braila, Romania

Teacher of Phisycs, Secondary
School "Emil Panaitescu", Cudalbi,
Galati, Romania

"Ten Years With GeoGebra"

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Antohe Valerian - R

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Valerian Antohe @ **Mireca Crisnic**
 ROMANIA

1st High Teacher
 Pompano Beach Senior High School
 Florida, Romania

Teacher of Physics, Secondary
 School "I. L. Caraculeni", Cahul
 County, Romania

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 "The GeoGebra Institute in Timisoara"
 Timisoara, Romania
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 More information on GeoGebra: <http://www.geogebra.org/m>

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Perspective-GeoGebra-Innovation!

2010-2019
 Today, as math teacher or as teacher of science, we use GeoGebra software: in pencil, compass, ruler, protractor, tables of trigonometry, geometry, limits! The list is long!

...and we appreciate 3D Geometry too!

asked: how to an old case of our first geometrical angles, trigonometry?

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Imagine real function

GeoGebra software interface showing a graph of a function.

Linz-AUSTRIA

DANUBE RIVER

GeoGebra software interface showing a graph of a function.

Braila-ROMANIA

GeoGebra software interface showing a graph of a function.

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GeoGebra logo and software interface.

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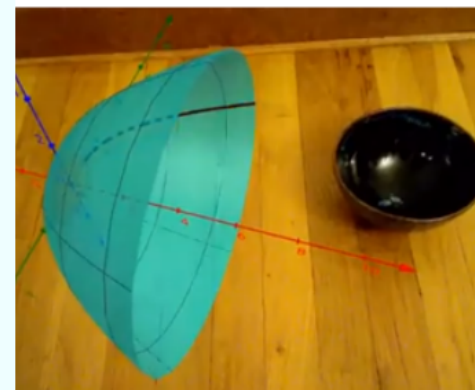
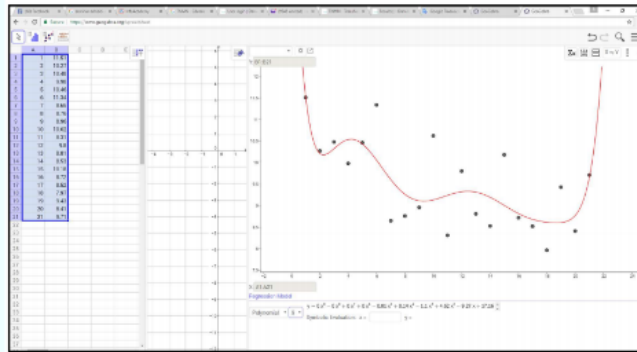
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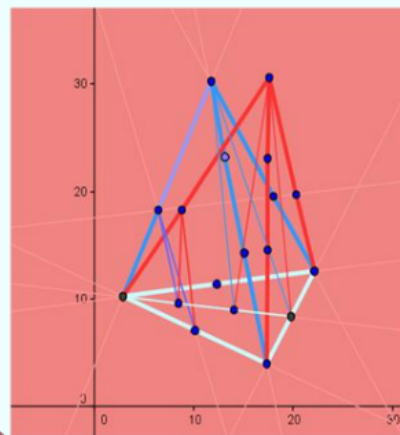


2010-2019

Today, as math teacher or as teacher of science, we use GeoGebra software to present statistics, linear regression, polinom of interpolation, geometric locus !
The list is open!



...and we appreciate 3D
Geometry too!



and we think to an
old...one of our first
geometrical anaglip,
tiring 3D vision !

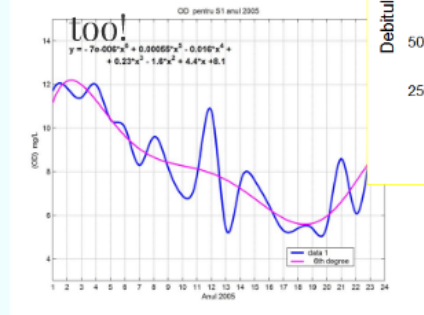
Linz-AUSTRIA



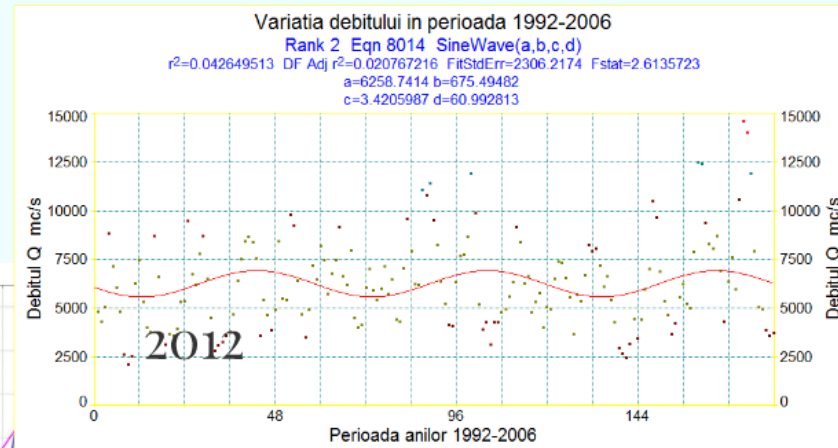
DANUBE RIVER

GeoGebra is used for a mathematical model which was used an original algorithm, discovering that the Danube River corp of water has a 6 year periodicity for it visible flood periods in the Lower Danube area.

Linz and Braila are cities on the Danube shores, one of the most important river of Europe Union connected by this corp of water but connected into GeoGebra



PhD Tesis- Valerian Antohe 2012



Braila-ROMANIA

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you could complicat
It will be a real pr
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Markus Hohenwarter & Zsolt Lavicza, “Gaining momentum: GeoGebra inspires educators and students around the world”, Vol. I., No.1, 2010

Perspective-GeoGebra-Inovation!

GGIJRO

Exploring the first edition of the first journal GGIJRO in 2010, we could resume some titles and authors as:

“GeoGebra in the context of the IT Surrounding Environment” - Antohe Valerian - Romania;

“Exploring differential geometric space using GeoGebra” - Kyeong-Sik Choi - Korea, 2010;

“First Decade of GeoGebra: Looking back through Socio-Cognitive Lenses” - Dragana Martinovic, Zekeriya Karadag, Viktor Freiman - Canada;

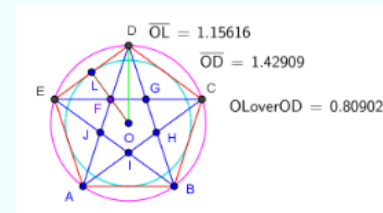
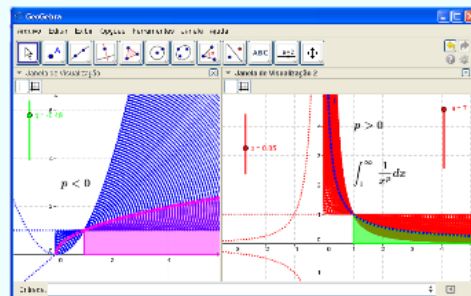
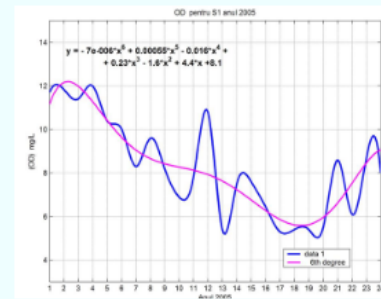
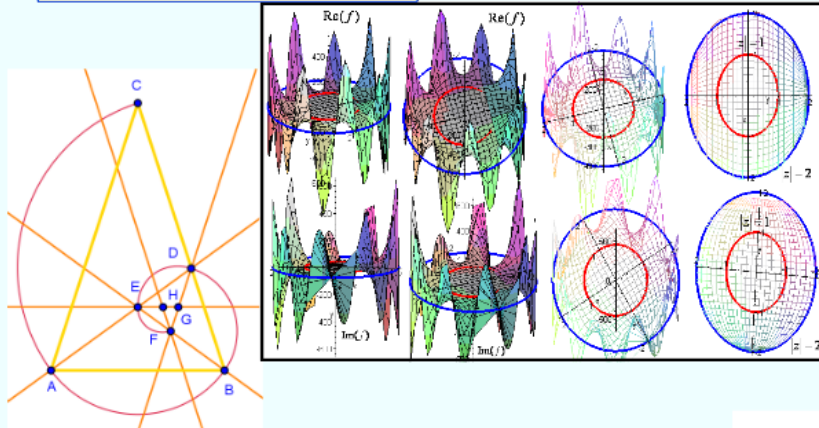
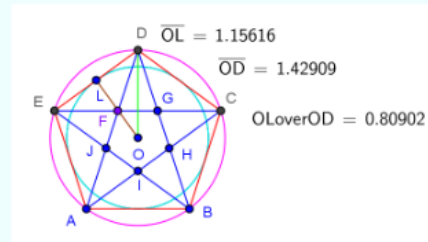
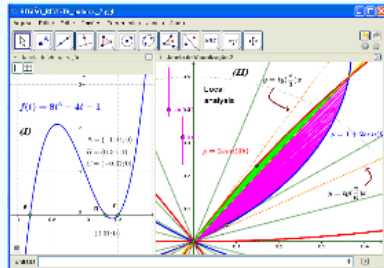
“Some geometric models of ancient astronomy with Geogebra” - Leandro Tortosa - Spain;

“Using GeoGebra as an Expressive Modeling Tool: Discovering the Anatomy of the Cycloid’s Parametric Equation” - Tolga Kabaca, Muharrem Aktunen - Turkey;

all of these belong to the year of 2010
and, of course, these research findings are actuals,
today and tomorrow.

Themes, problems, exploring GeoGebra

Images which incite and transmit the complexity of GeoGebra



GGIJRO

ISSN: 2068-3227

<https://ggijro.wordpress.com/>

GGIJRO=International GeoGebra Community

The screenshot displays the website for GGIJRO, titled "The New Language For The Third Millennium". The header includes the journal's name and ISSN. The left sidebar identifies the Chief Editor as Valerian ANTOHE and provides contact information. The main content area features a "Book Reviews" section with a paragraph about the journal's recognition in the Index Copernicus Database and its inclusion in the IC master list for 2011. Below this text is a grid of logos from various institutions and databases, including Google+, DRJI, Index Copernicus International, Georgetown University Library, State Library, CiteFactor, University of Saskatchewan, and INNO SPACE.

**The New Language
For The Third Millennium**

GGIJRO
GeoGebra International Journal of Romania

★ GEOGEBRA
Chief Editor
Valerian ANTOHE
WWW.GEOGEBRA.RO

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Book Reviews

The International GeoGebra Journal

"GeoGebra The New Language For The Third Millennium" It is in the Index Copernicus Database. [International Index Copernicus](#) evaluated our journal and give an Index Copernicus Value of 5,09 ICV points, including the journal in the [IC master list for year 2011](#). The GGIJRO Journal has declare the Open Source form and it is included in the [DOAJ](#) international database.

Logos displayed include: Google+, DRJI, Scientific Indexing Services, INDEX COPERNICUS INTERNATIONAL, GEORGETOWN UNIVERSITY LIBRARY, STATE LIBRARY, CiteFactor, UNIVERSITY OF SASKATCHEWAN, and INNO SPACE SJIF Scientific Journal Impact Factor.

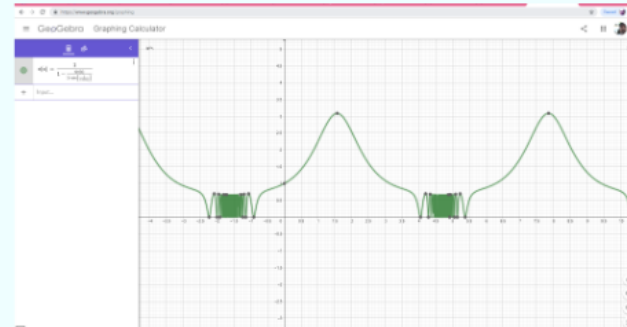
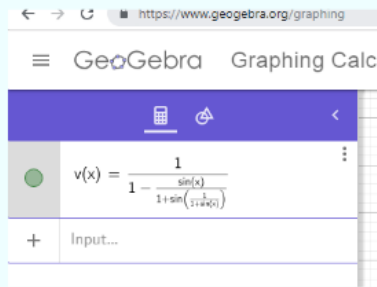
2019

Classical problem:
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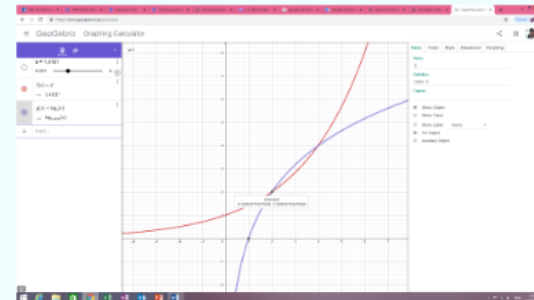
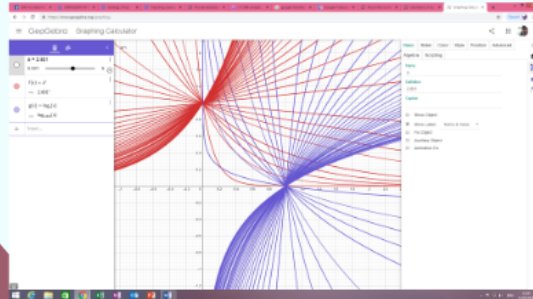
$$v(x) = 1 / (1 - \sin(x) / (1 + \sin(1 / (1 + \sin(x))))))$$



And an open problem!

"How many solutions could have the equation below?"

$$\log_a(x) = a^x$$



What about the intersection
between red and blue curves?



Associate 3D

unity



We propose this:

Because the submergence of the 2D or 3D Euclidean Space, isomorphic with $\mathbb{R} \times \mathbb{R}$ and $\mathbb{R} \times \mathbb{R} \times \mathbb{R}$ in a $\mathbb{Q} \times \mathbb{Q}$ or $\mathbb{Q} \times \mathbb{Q} \times \mathbb{Q}$ space, represented by the computer screen, rational coordinate points, could induce erroneous appraisals for some geometric figures, such as graphs of some real function elements, some message about these possible errors must appear on the screen. The student will then be led to that mathematical set of analysis done with the pen on his paper and will use the differential calculus or boundaries of real functions in order to see with the mind's eye the real context.

This problem shows the infinite direction of using and develop math with GeoGebra.

Today we could not appreciate the limits of the development of the software but more than these could not appreciate the perspective of cover the software with real problems of math of physics or science in general. We appreciate today that the engine must be the sets of ideas of using the GeoGebra software and teacher of science must be in the first line! So, give us the problem and let's see what we shall ask GeoGebra to do! This is it!



214BC
Arquímedes

The contemporary man
2019 AC



This is the unlimited way between "Nolite tangere circulos meos!" and "Do not delete my PC folder!"

Imagine real function

$$F(x) = x/\sin x$$

$$G(x) = (x^2 - 3x + 2)/(x^2 - 1)$$

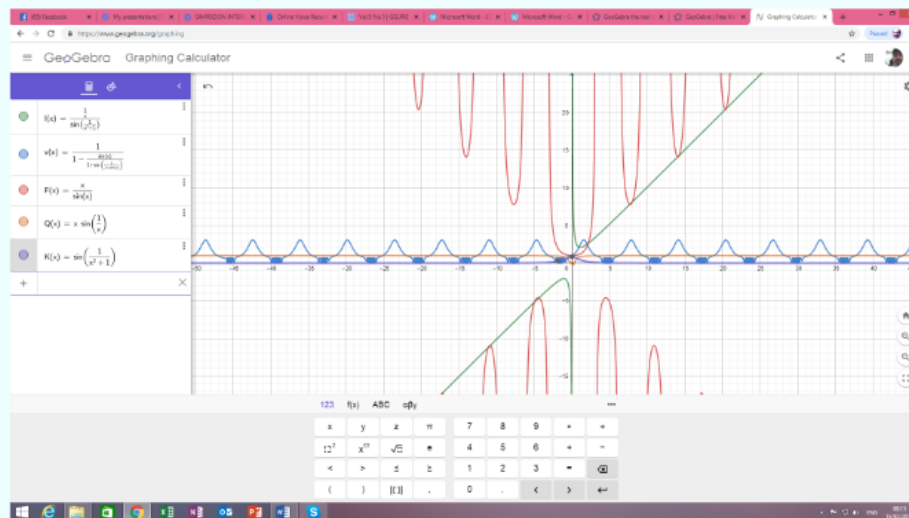
$$H(x) = (1 + 1/x)^x$$

$$Q(x) = x * \sin(1/x)$$

$$K(x) = \sin(1/(x^2 + 1))$$

$$l(x) = (1/x) / \sin(1/(x^2 + 1))$$

$$v(x) = 1 / (1 - \sin x / (1 + \sin(1/(1 + \sin x))))$$



Take any of these copy and paste in GeoGebra ! After this you could complicate the expression of these real function. It will be a real provocation to analyze some of them around it's accumulation points!

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Valerian Antohe @ **Mireca Crisnic**
 ROMANIA

1st High Teacher (Romania) @ Liceu Nicolae Balcescu, Braila, Romania
 Teacher of Physics, Secondary School "I. L. Caraculovici", Giurgiulesti, Romania

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 "High quality, high level of peer-reviewed work" - Please contact: valerian@valerian Antohe
 "High quality and an important addition to the existing literature" - Please contact: valerian@valerian Antohe
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 The last lesson

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GeoGebra - Graphing Calculator

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DANUBE RIVER

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GeoGebra

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valerian_antohe@yahoo.com