

# GeoGebra

Dynamic Mathematics for Everyone

## International GeoGebra Institute

Zsolt Lavidza  
 University of Cambridge  
<http://www.geogebra.org/IGI>

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## Overview

- Short History
- Community
- Research
- Future



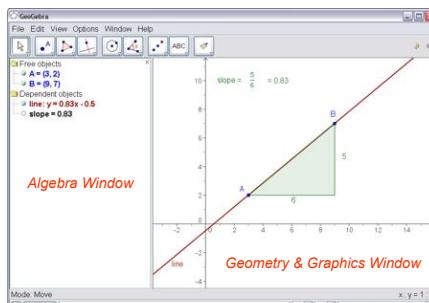

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## History of GeoGebra

2001 - 2011

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## GeoGebra = Geometry + Algebra



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## Open Source > Free



Free software is a matter of liberty, not price.  
 To understand the concept, you should think of free as in free speech, not as in free beer.  
 (Free Software Foundation)

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## 2001-2006: Development

- Mar 2002: Master's thesis in Computer Science & Mathematics Education
- Nov 2002: European Academic Software Award
- Mai 2005: User Forum & GeoGebraWiki
- Feb 2006: PhD project in Mathematics Education funded by Austrian Academy of Sciences
- December 2007: International GeoGebra Institute



## Examples of Using GeoGebra 3.2

- Visualizing

students can “see” abstract concepts

- Representations

students can make connections

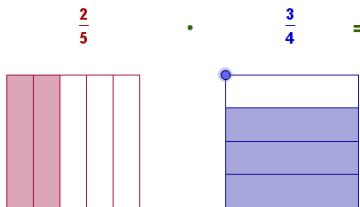
- Experiments

students can discover mathematics

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### Age 6-10: Adding Integers

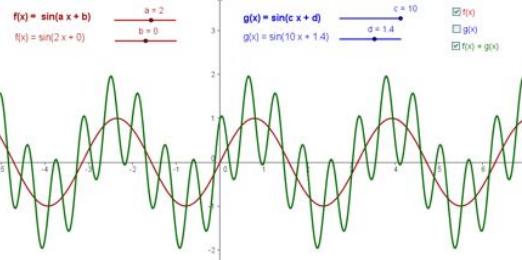
### Age 11-14: Multiplying Fractions

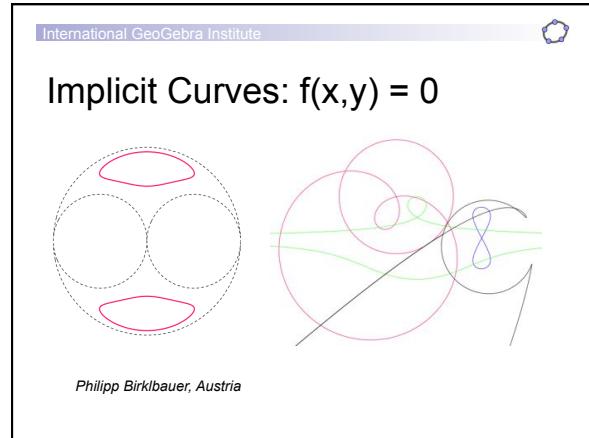
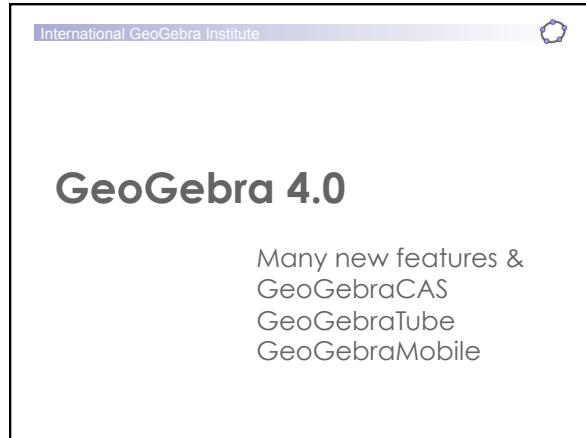
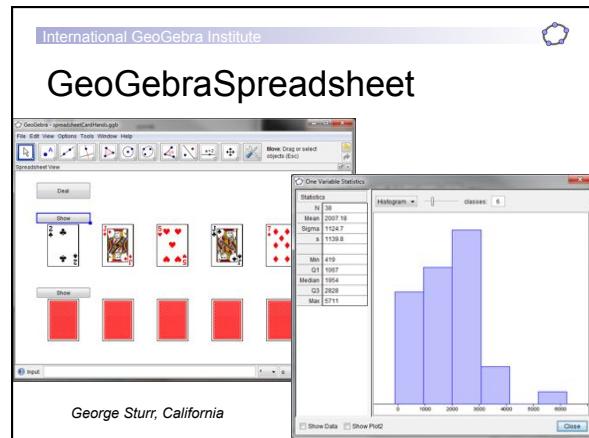
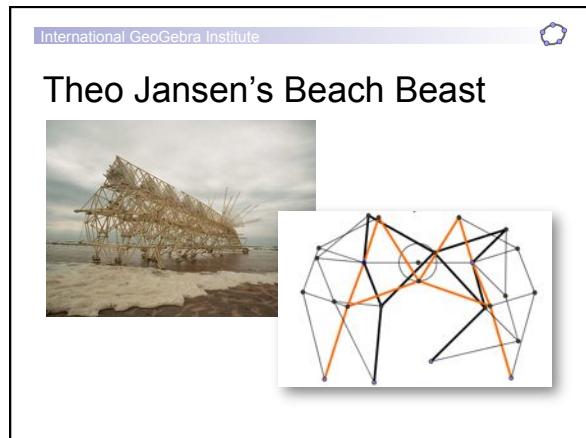
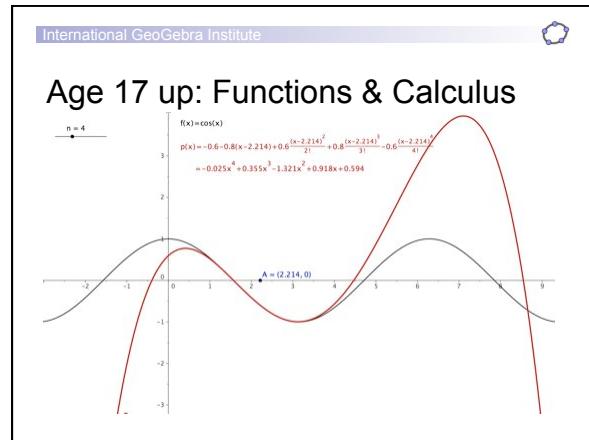
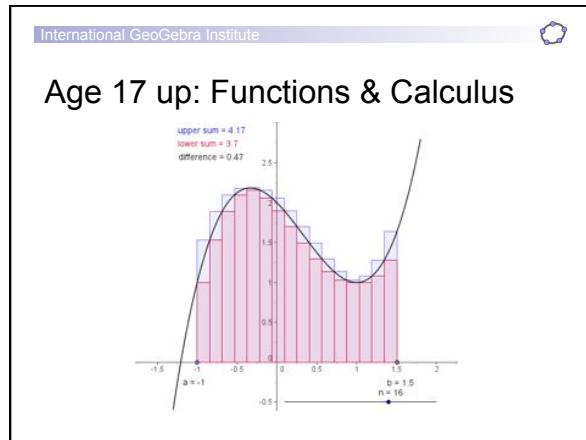


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### Age 15-16: Geometry & Algebra

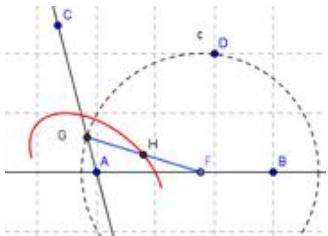
### Age 17-18: Visualizing Parameters





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## Locus Line Equation



Sergio Rodriguez & Miguel Abanades, Spain

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## GeoGebraCAS



- Full integration of a symbolic view in GeoGebra
- Dynamic updates of dependencies
- Easy to use starting from age 13 Markus Hohenwarter, Austria

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## GeoGebraMobile

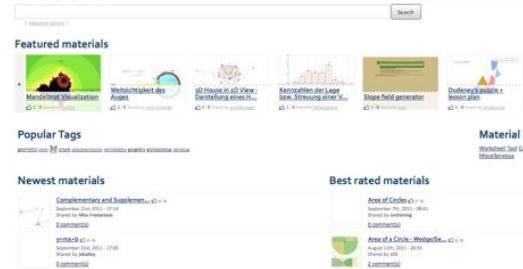


- GeoGebra Applets should work on Smartphones
- iPhone, iPad, Android

Gabor Antcsin & Zoltan Kovacs, Szeged, Hungary

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## GeoGebraTube



This screenshot shows the GeoGebraTube website interface with sections for Featured materials, Popular Tags, Newest materials, and Best rated materials.

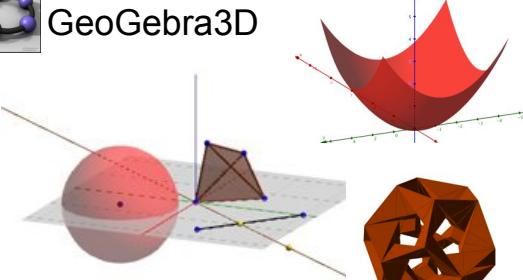
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## GeoGebra 5.0

New features &  
GeoGebra3D  
GeoGebraTouch  
GeoGebraPrim  
GeoGebraSTEM  
GeoGebraMobile+

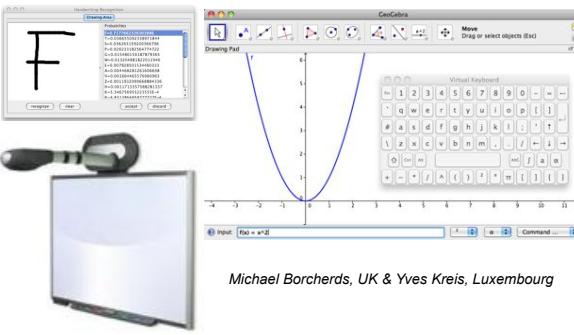
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## GeoGebra3D



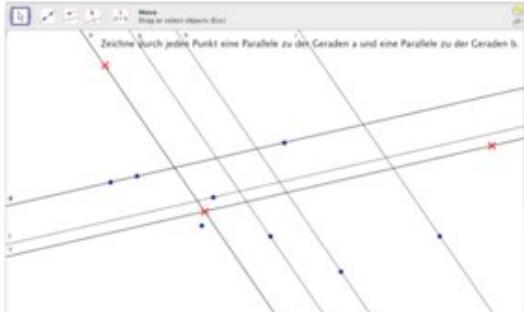
Andre Eriksson, Sweden & Mathieu Blossier, France

**GeoGebraTouch**



Michael Borcherds, UK & Yves Kreis, Luxembourg

**GeoGebraPrim**  
■ GeoGebra for Primary schools

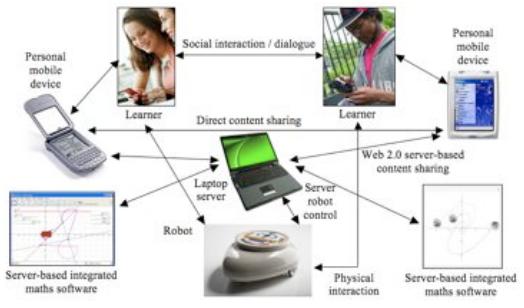


**GeoGebraSTEM: ExpEye, Phoenix Computer Integrated Science Environments**



Tata Institute for Fundamental Research, Mumbai, India

**GeoGebraSTEM:**  
Lego Mindstorms Robot project



**GeoGebraSTEM:**  
Game consoles, Wii, Kinect, Predator, Leonar3Do



**GeoGebraProgramming Raspberry Pi**



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## GeoGebraProgramming (Python)

```

    # Create some random points
    points = []
    for i in range(10):
        x = random.uniform(-2, 5)
        y = random.uniform(-2, 5)
        points.append((x,y))
    print("points = " + str(points))

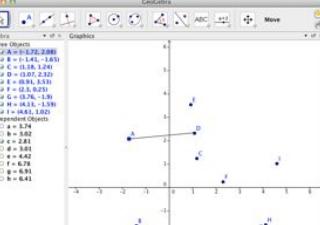
    # Create a function that shows only the shortest segment
    def showShortestSegment():
        for i in range(len(points)-1):
            if distance(points[i], points[i+1]) < distance(points[i], points[i+2]):
                drawSegment(i)
            else:
                drawSegment(i+1)

    # Create this every time A is updated
    def updateA():
        drawSegment(0)

    # Run once A is around in the Euclidean viewer
    drawSegment(0)
    
```

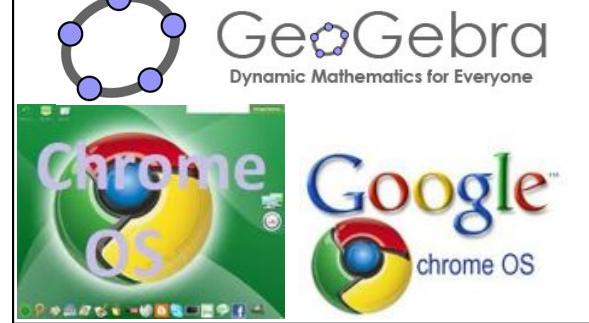
g others: if you omit the second line, you will need to log out and in again for the change to take effect.

GeoGebra - Python Demo



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## GeoGebra and Chrome OS



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## GeoGebra Community

If you want to go fast,  
go alone.  
  
If you want to go far,  
go together.

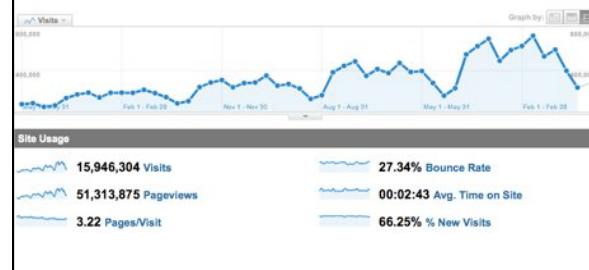
Warren Buffett

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## Visitors GeoGebra website 2007-2011

Dashboard

May 1, 2007 - Aug 27, 2011



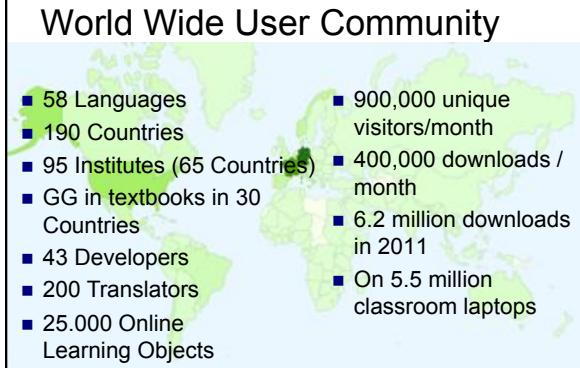
Visits: 15,946,304  
Bounce Rate: 27.34%  
Pageviews: 51,313,875  
Avg. Time on Site: 00:02:43  
Pages/Visit: 3.22  
New Visits: 66.25%

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## World Wide User Community

- 58 Languages
- 190 Countries
- 95 Institutes (65 Countries)
- GG in textbooks in 30 Countries
- 43 Developers
- 200 Translators
- 25.000 Online Learning Objects

- 900,000 unique visitors/month
- 400,000 downloads / month
- 6.2 million downloads in 2011
- On 5.5 million classroom laptops



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## Visitors from 190 countries

Detail Level: Country/Territory	Visits	Pages/Visit	Avg. Time on Site	% New Visits
1. France	2,757,773	3.27	00:02:27	66.30%
2. Germany	2,641,342	3.17	00:02:27	69.95%
3. United States	1,686,015	3.03	00:02:48	62.83%
4. Italy	903,086	3.56	00:02:49	66.83%
5. Spain	624,854	3.33	00:02:45	66.16%
6. Norway	579,134	2.79	00:02:05	63.01%
7. Austria	552,587	3.19	00:02:30	63.98%
8. Belgium	475,219	2.97	00:02:00	64.17%
9. Denmark	453,964	2.63	00:02:02	67.96%
10. Brazil	422,791	3.14	00:03:19	70.08%
11. Mexico	396,552	3.06	00:03:20	71.29%
12. United Kingdom	284,917	3.66	00:03:34	60.94%
13. Switzerland	275,478	3.11	00:02:24	65.66%
14. Greece	272,746	3.11	00:02:39	64.11%
15. Portugal	257,864	3.77	00:02:51	66.29%
16. Canada	230,569	2.92	00:02:31	66.89%
17. Netherlands	182,876	2.98	00:02:25	65.15%

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# GeoGebraWiki – Shared examples

 **GeoGebra**

About

Article Discussion View source History

Main Page

Welcome to the International GeoGebraWiki!

GeoGebraWiki is a free pool of teaching materials for the dynamic mathematics software GeoGebra. Everyone can contribute and upload materials! All contents of this pool may be used free of charge.

English - French

Catalan, B-X, Chinese, Czech, Danish, Dutch, English UK, Finnish, German, G-Greek, Hindi/Hindi, Indonesian, Italian, B-Li-Pi, Korean, Persian, Persian Farsi, Polish, Portuguese, Russian, Slovenian, Slovak, Spanish, Swedish, Tamil, Turkish, Yiddish/Ukrainian, Vietnamese

Workshops · Know how · Tools · Publications  
Popular Materials · Amazing Aspects · GeoGebra Art · New Articles · All Articles

Help for GeoGebraWiki · Find out about this Wiki!  
GeoGebra Upload Manager · to upload your materials  
Image Upload · to upload your images  
GeoGebra Homepage · everything about the software GeoGebra

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# GeoGebraTube

 **GeoGebra**

About Download

You are here: GeoGebraTube > Overview

Search

Featured materials

Weltkarte des Auges, Wettbewerbs-Aufgaben, 3D House in 3D View, Geometrie einer Vier..., Keine Zeit, Slope Field generator, Dodecaeder und Lernen ab... [more]

Popular Tags

Material 1 · Mathe und Geometrie für Kinder und Jugendliche

Newest materials

Complementary and Supplement... [more] · September 29, 2012 · 17:18 · 4 comments · by j4kob · Shared by j4kob · 0 comments

Vertical Angles [more] · October 1, 2012 · 17:08 · 3 comments · by j4kob · Shared by j4kob · 0 comments

Area of a Circle - Wedges [more] · September 29, 2012 · 16:48 · 2 comments · by gvoigt · Shared by gvoigt · 0 comments

Dodecaeder [more] · September 29, 2012 · 16:46 · 2 comments · by gvoigt · Shared by gvoigt · 0 comments

Best rated materials

Material 1 · Mathe und Geometrie für Kinder und Jugendliche

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# GeoGebraForum – Questions/help

 **GeoGebra**

About Download Help Wiki Forum

Login Register FAQ Search

GeoGebra User Forum

Last visit was: [Date.unsetected.1200 1 view.active.stats](#)

It is currently Thu Oct 16, 2012 3:09 am (All times are UTC + 1 hour.)

Forum	Topics	Posts	Last post
English speaking users			
User Geoboard	1464	7580	Thu Oct 16, 2012 2:39 am (UTC+0)
Questions concerning the use of GeoGebra as a stand-alone application	748	3482	Thu Oct 16, 2012 12:48 am (UTC+0)
Mathematical Questions			
Instrumentation, dynamic worksheets, GeoGebraWiki, JavaScript, etc.			
German speaking users			
Hilfe mit GeoGebra	829	3236	Wed Oct 15, 2012 9:38 pm (UTC+0)
Frage nach der Bedeutung von GeoGebra als Einsatzanwendung	370	1425	Tue Oct 16, 2012 3:45 pm (UTC+0)
Technische Fragen			
French speaking users			
Français	3887	11000	Thu Oct 16, 2012 1:18 am (UTC+0)
Forum pour les utilisateurs de GeoGebra qui parlent français			
Autre	51	379	Sat Oct 13, 2012 8:44 am (UTC+0)
Français Archivé	146	857	Wed Nov 28, 2012 8:22 pm (UTC+0)
international users			

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# International GeoGebra Institute

2007-2011

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# Core Aims of IGI

- Teacher training and support
  - Offer workshops & support
- Material and software development
  - Share free materials
- Research
  - Encourage and coordinate collaborative research
- (Outreach)
  - Enable disadvantaged communities

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# 95 Current GeoGebra Institutes

65 countries. More coming soon ...



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



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### Planned Institute Centres

- **Linz, Austria** – Software development
- **Budapest, Hungary** – Community support
- **Cambridge, UK** – STEM and Research
- Possible other centres

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### GeoGebra Events

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### GeoGebra Events

- Individual Workshops
- GeoGebra Conferences (1 in 2009; 12 in 2010; 25 in 2011)

[www.geogebra.org/events](http://www.geogebra.org/events)

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### Partner school network

- Involve more teachers in the community
- Schools experimenting with the use of GeoGebra
- Encourage collaboration among schools and teachers
- Be able to offer more support
- Sponsors can donate to schools

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## GeoGebra Additional activities

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### One Laptop per Child Project




Tata Institute for Fundamental Research, Mumbai, India



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### Argentina 3million netbooks



3 millones de netbooks para escuelas públicas del país.

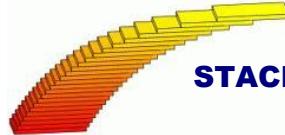
Para alumnos y docentes de todas las escuelas públicas del país.  
Para escuelas de educación especial e institutos de formación docente.

Ver video institucional     descubrir la netbook en 3D

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### GeoGebra and assessment systems

■ **WeBWorK, US**  **WeBWorK**



**STACK, UK**

**TAO, Luxembourg** 

A joint initiative of ICAR Luxembourg and the University of Luxembourg

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### Textbooks



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### On-line schools websites



MATHLETICS

CYBELEC INFRANOR GROUP COMPANY

Florida Virtual School

enrich Specialists in rich mathematics

K12

ZUMA ed. Imaginative Content For Imaginative Educators

class.com

EXCEL - SOFT TECHNOLOGIES PVT. LTD.

GEOGEBRA Technology solutions for Education & Training

[www.GeoGebra.org](http://www.GeoGebra.org)

**International GeoGebra Institute**

**Facebook:** <http://facebook.com/geogebra>



The Facebook page for the International GeoGebra Institute features a post from the official account (@geogebra) about the opening of the Geogebra Institute of Argentina. It includes a link to the event page and a photo of two people working on a laptop.

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**Youtube:** <http://www.youtube.com/geogebachannel>



The YouTube channel displays several video thumbnails, including one titled "GeoGebra at Tech Awards" and another titled "Perspective of an Italian castle with GeoGebra". The channel has over 10,000 views and 100 subscribers.

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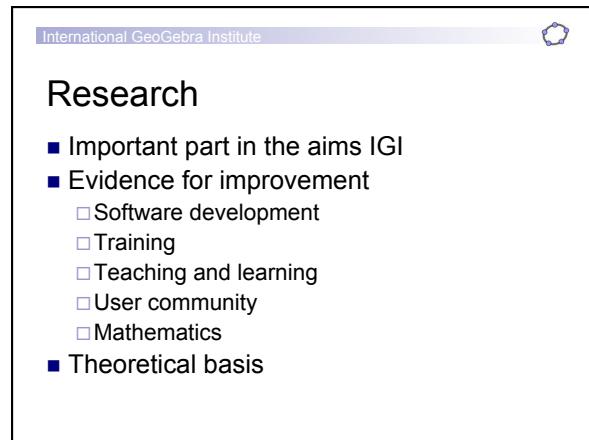
## GeoGebra Research



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## Research

- Important part in the aims IGI
- Evidence for improvement
  - Software development
  - Training
  - Teaching and learning
  - User community
  - Mathematics
- Theoretical basis



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## Research priorities

- Several current research projects with GeoGebra
  - Teacher research (PD, teaching practices)
  - Research on existing materials (WIKI, workshops)
  - Software development/improvement
  - Community research (WIKI, forum, local groups)
  - Student research (understanding, learning, reasoning, proof)
  - Open-source research (availability, accessibility)
  - Other? Research Committee



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## Possible collaborations

- Using GeoGebra in teaching
- Research on teaching
- Research on mathematics
- Involve students (projects, masters, PhDs)
- Software development (SAGE+GeoGebra)
- Being part of the Hungarian GeoGebra Network
- Popularizing Science and Engineering

