

GeoGebra

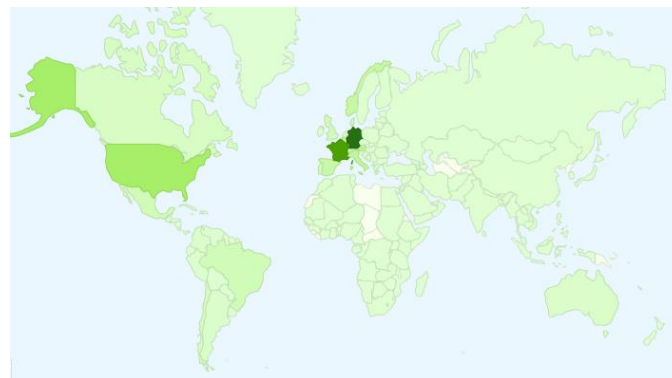
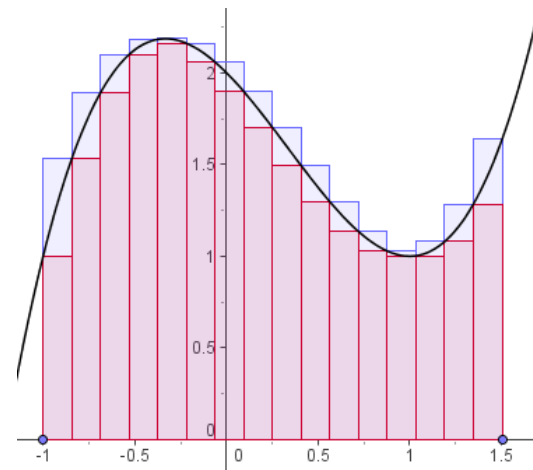
Conference 2009

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Florida State University
markus@geogebra.org



Overview

- Short History of GeoGebra
- Future Plans
- GeoGebra Community
- International GeoGebra Institute





GeoGebra

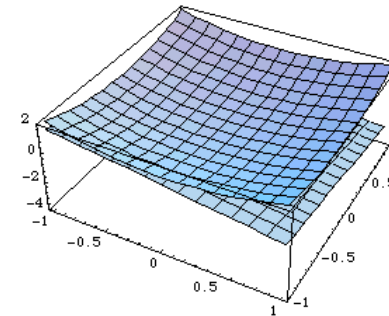
Short History



Computer Algebra Systems

Derive

```
Clear[f, fx, fy, a, b, c]
f[x_, y_] := x^2 + y^2
x0 = -0.5;
y0 = -0.5;
fx[x_, y_] = D[f[x, y], x];
fy[x_, y_] = D[f[x, y], y];
a = fx[x0, y0];
b = fy[x0, y0];
c = f[x0, y0] - a x0 - b y0;
T[x_, y_] := a x + b y + c
Show[Plot3D[f[x, y], {x, -1, 1}, {y, -1, 1},
PlotRange -> {-4, 2}],
Plot3D[T[x, y], {x, -1, 1}, {y, -1, 1},
PlotRange -> {-4, 2}]]
```



Mathematica



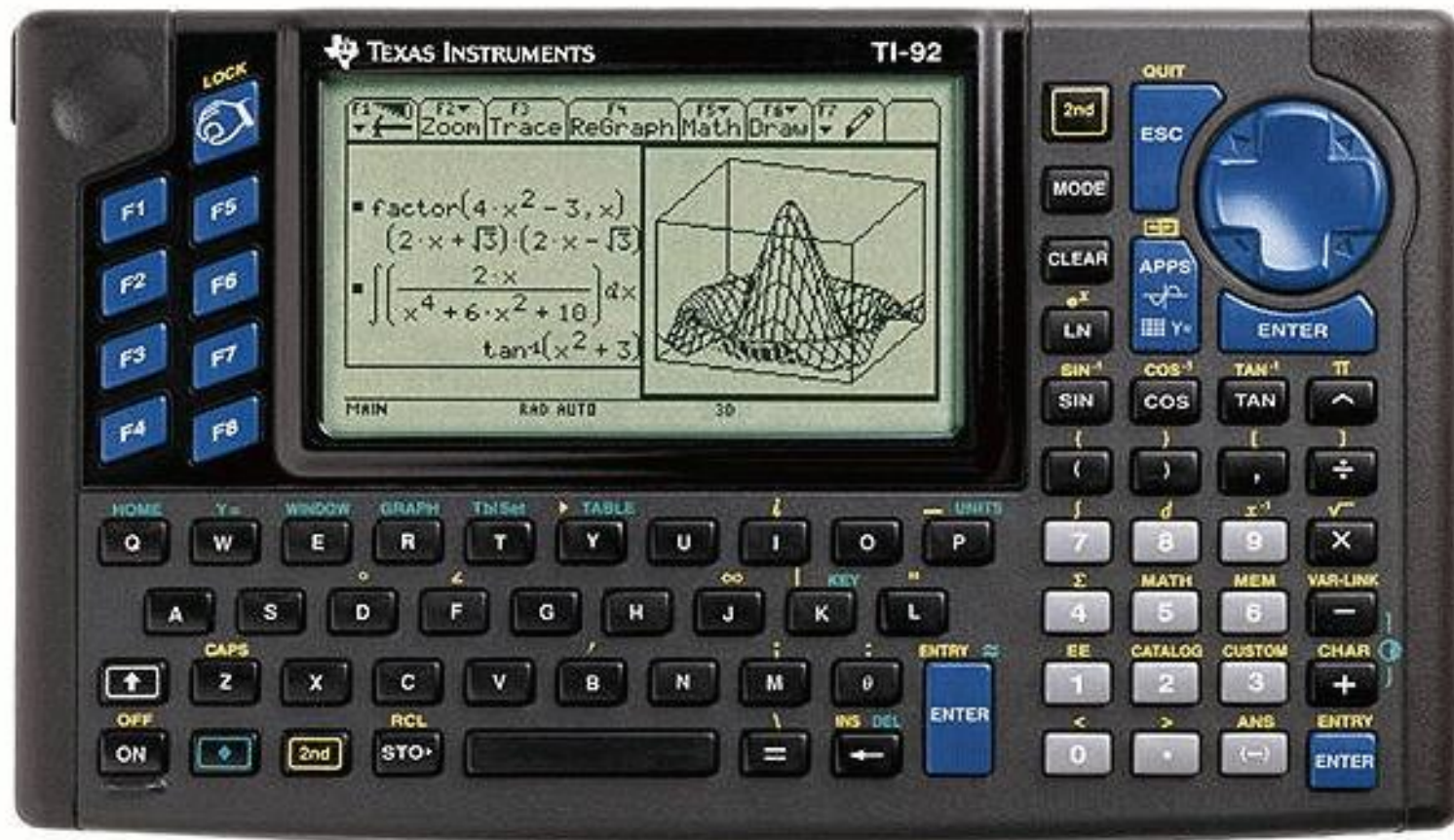
Dynamic Geometry Software

The image displays three overlapping windows from dynamic geometry software:

- Cabri Geometry II Plus - [3 circles.fig]**: Shows a geometric diagram with a green circle and a black circle. A pink line segment is drawn. The text "Area of the green circle + are" and "24.10 cm²" is visible. The interface includes a menu bar (File, Edit, Options, Session, Window, Help) and a toolbar with various construction tools.
- GEONExT**: Shows a similar geometric diagram with a green shaded region. The text "Fichier Edition Affichage Feuille de dessin Objets Fenêtre" is visible. The interface includes a menu bar and a toolbar.
- Netscape: Midpoint.cdy**: Shows a geometric diagram with several circles and points labeled A, B, C, D, E, F, G, H, K. The text "Construct the midpoint of A and B! You may use ruler and compass only. You need two circles with equal size. Next hint available in 28 seconds. You are on the right track! Great! You solved this exercise!" is visible. The interface includes a menu bar (File, Edit, View, Go, Window, Help) and a toolbar.



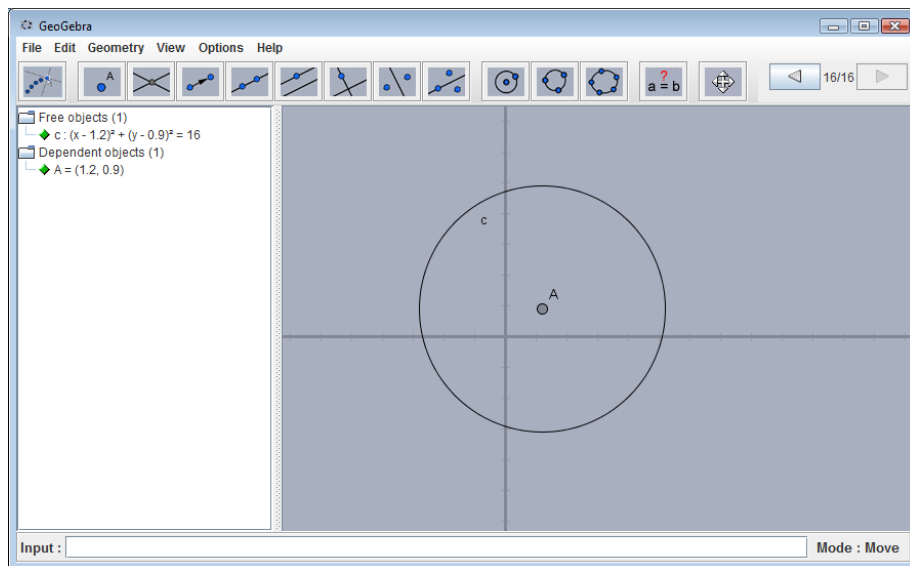
TI-92: DGS and CAS





GeoGebra = Geometry & Algebra

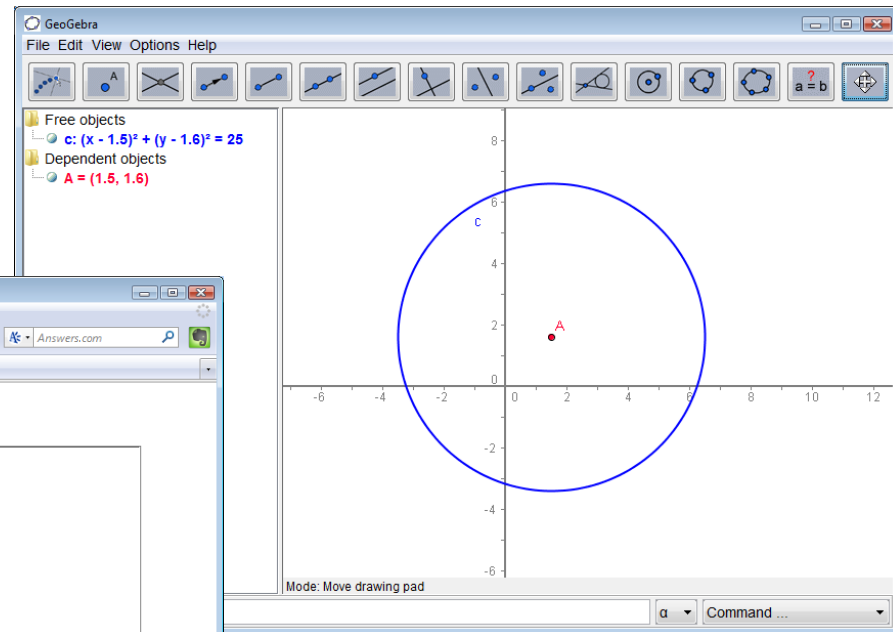
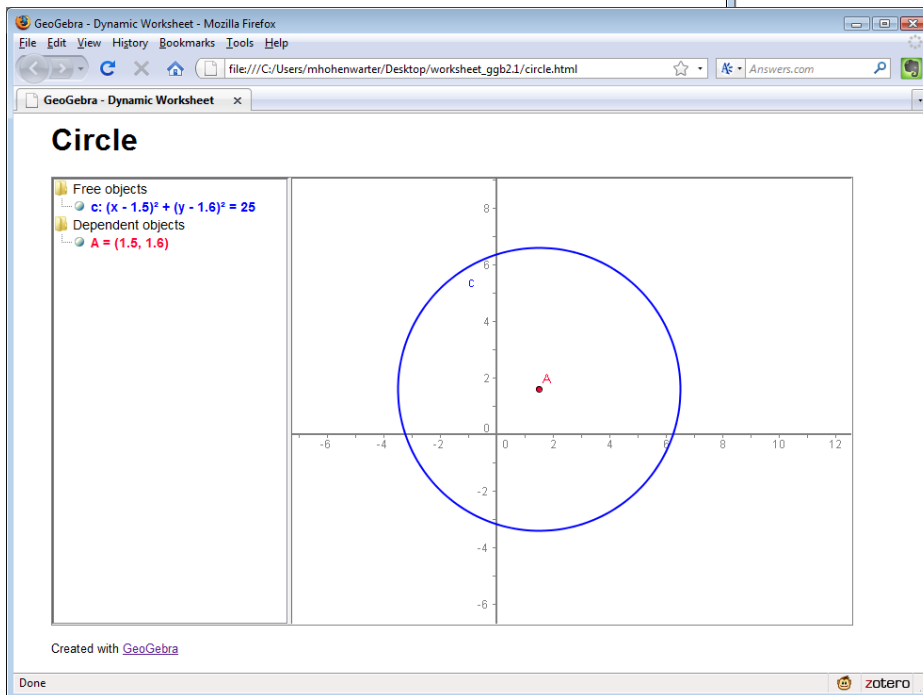
- 2001/02
Master's Project
Univ. Salzburg
- Version 1.0
April 2002
- Tool for Analytic Geometry:
points, vectors, lines, conic sections
- Nov 2002:
European Academic Software Award





Dynamic Worksheets

- Version 2.1
January 2004



- Interactive
web pages



2005: GeoGebra User Forum



GeoGebra
User Forum

GeoGebra
www.geogebra.org

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Forum		Topics	Posts	Last Post
English speaking users				
	Using GeoGebra Questions concerning the use of GeoGebra as a stand-alone application	183	803	09. Oct 2007 4:45 mathmagic →
	Technological Questions Installation, dynamic worksheets, GeoGebraWiki, JavaScript, etc.	144	599	09. Oct 2007 19:41 AntonioRibeiro →
	Student Forum A place for students to discuss GeoGebra questions	4	7	08. Oct 2007 11:42 Klement →
German speaking users				
	Bedienung von GeoGebra Fragen rund um die Bedienung von GeoGebra als Einzelanwendung	203	674	10. Oct 2007 3:51 kalle2410 →
	Technische Fragen Installation, dynamische Arbeitsblätter, GeoGebraWiki, JavaScript usw.	127	513	11. Oct 2007 14:47 Yves Kreis →
	Schülerforum			18. Jan 2007 10:16

www.geogebra.org/forum



GeoGebraWiki – Free Materials


GeoGebraWiki
International

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, 中文 (Chinese), Danish, Dutch, German [↔](#), Greek, Italian
Norwegian, Persian, Portugese, Slovenian, Spanish, Turkish

Workshops - Know How - Tools - Publications - GeoGebra Art
New Articles - All Articles - Popular Materials

-  [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*
-  [GeoGebra User Forum](#) [↔](#) - the best place to ask questions

navigation

- [Main Page](#)
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search

toolbox

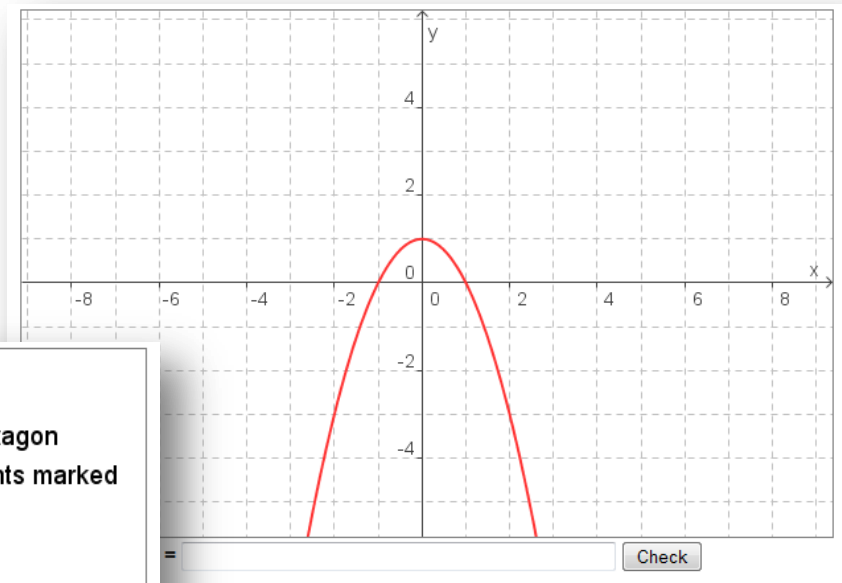
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www.geogebra.org/wiki



Interactive Dynamic Worksheets

Quadratic test



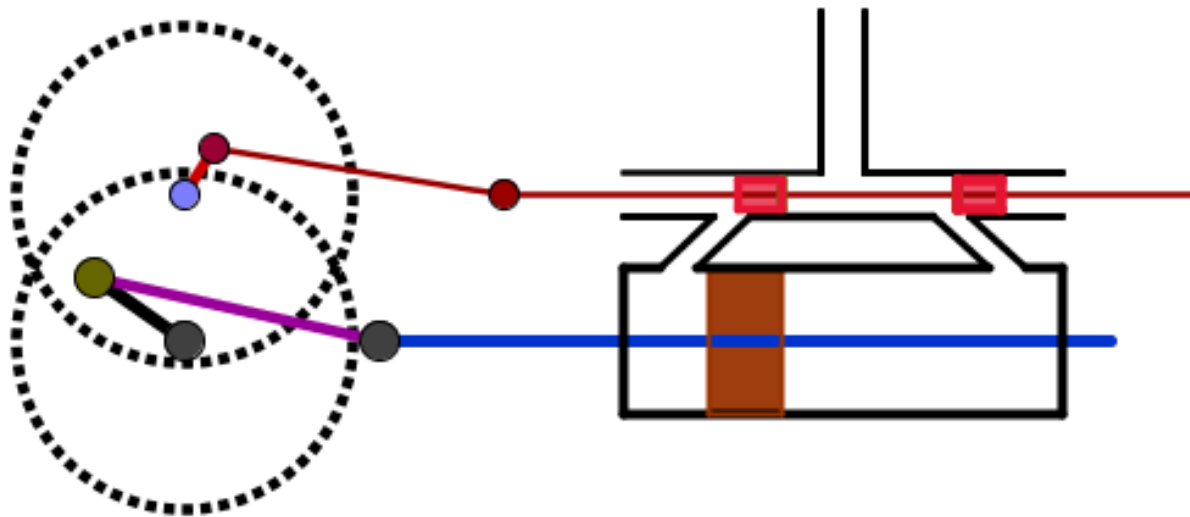
Regular hexagon
with midpoints marked

Equation: $u =$

Vectors



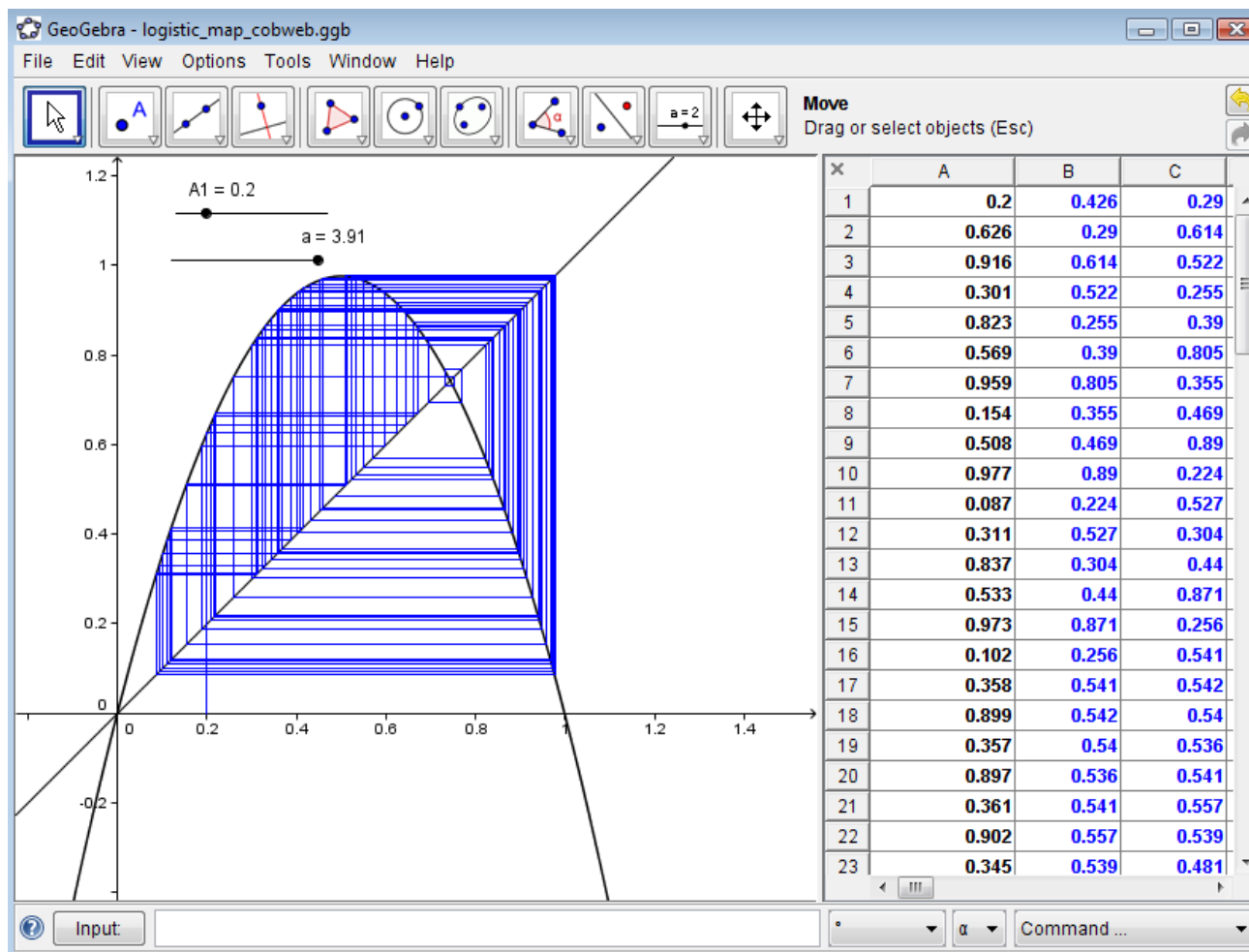
Animations in GeoGebra 3.2



B. Gabel, Deutschland

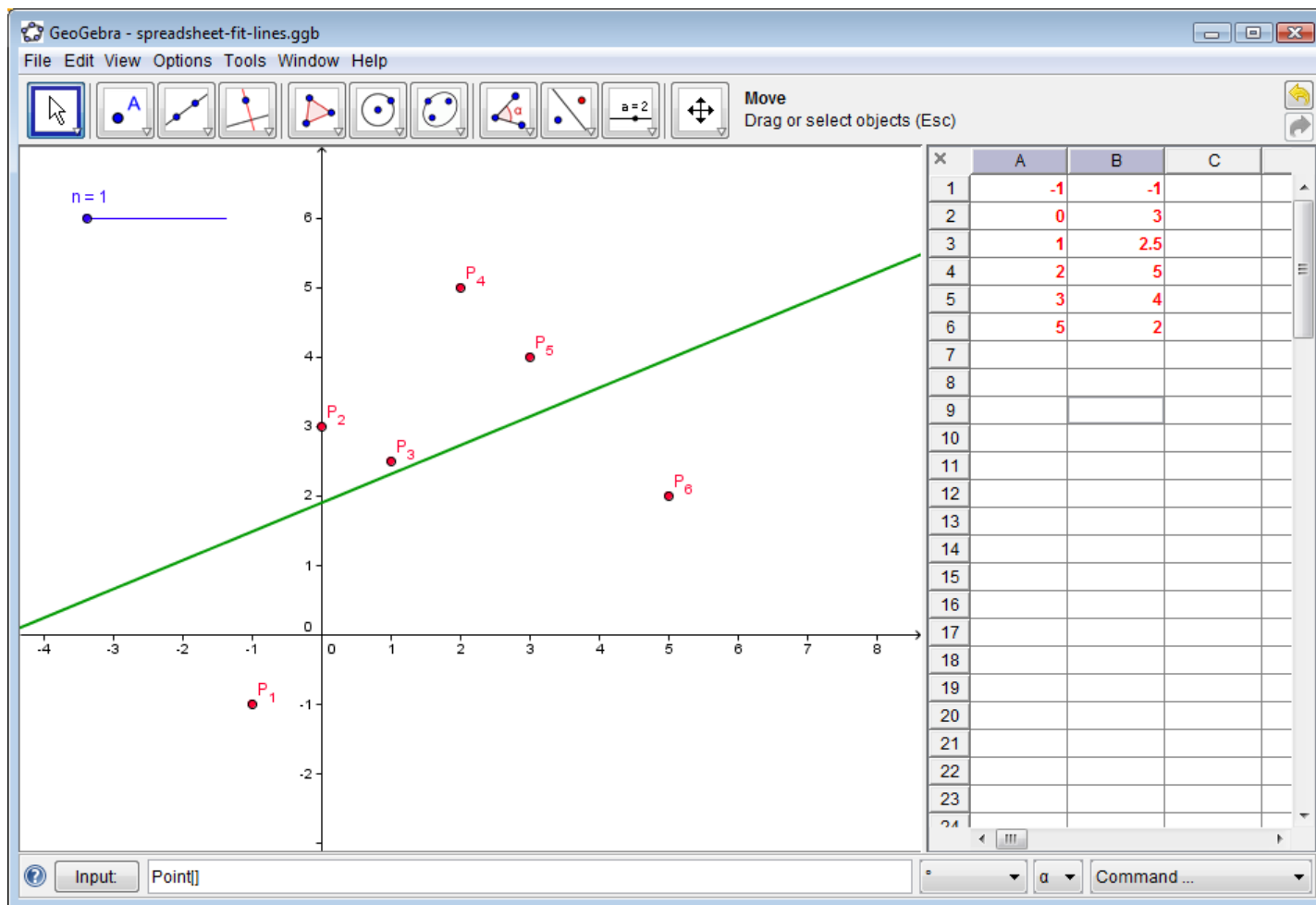


Spreadsheet in GeoGebra 3.2



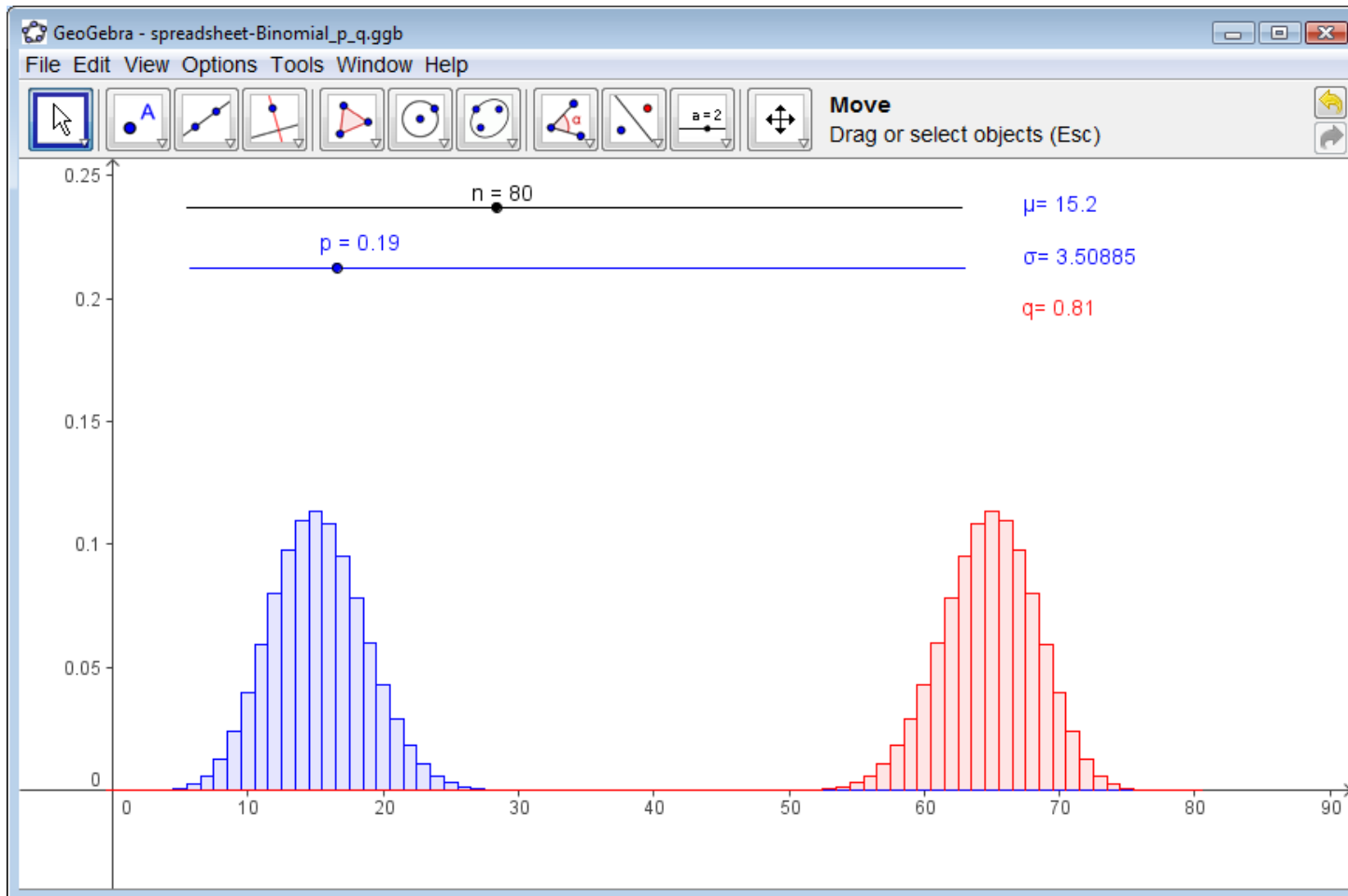


Regression Lines & Polynomials





Binomial Distribution





GeoGebra

Future



Future Plans

- Make it Easier, Easier, Easier!
- Drag & Drop User Interface
- Symbolic Algebra View (CAS)
- 3D Graphics
- ...



GeoGebraCAS

GeoGebra CAS interface showing a sequence of steps for solving the equation $3x + 4 = 7$:

- $3x + 4 = 7$
→ $3x + 4 = 7$
- $(3x + 4 = 7) - 4$
→ $3x + 4 - 4 = 7 - 4$
- $3x + 4 - 4 = 7 - 4$
→ $3x = 3$
- $(3x = 3) / 3$
→ $\frac{3x}{3} = \frac{3}{3}$
- $3x / 3 = 3 / 3$
→ $x = 1$
-

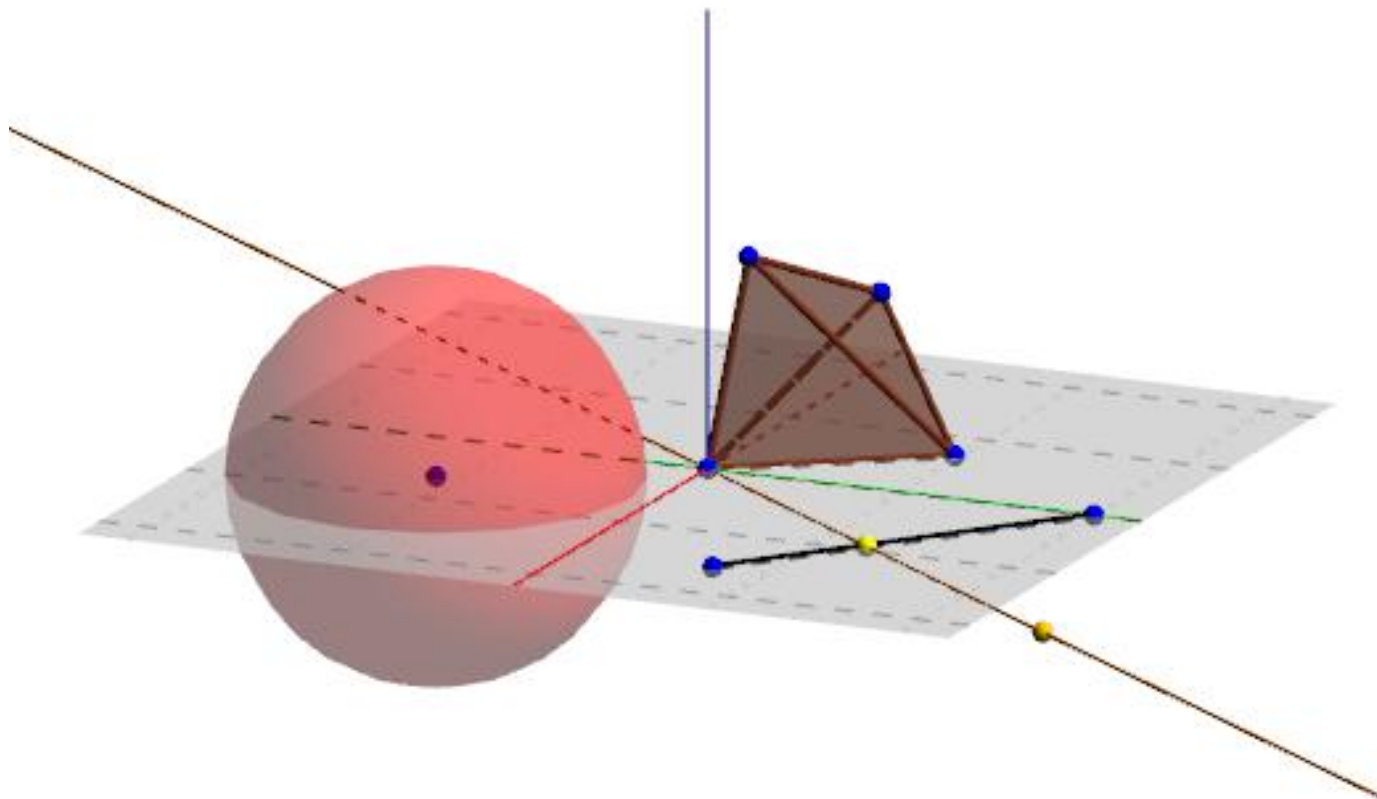
GeoGebra CAS interface showing a sequence of steps for calculating the limit of a function:

- $f(x) := x^2$
→ $true$
- $(f(a+h) - f(a)) / h$
→ $\frac{(a+h)^2 - a^2}{h}$
- $\text{Limit}[\#2, h, 0]$
→ $2a$

*In cooperation with the
Austrian GeoGebra Institute (AGI)
with support of the
Austrian Ministry of Education*



GeoGebra3D



Mathieu Blossier u.a., University of Rouen, France



GeoGebra **Community**

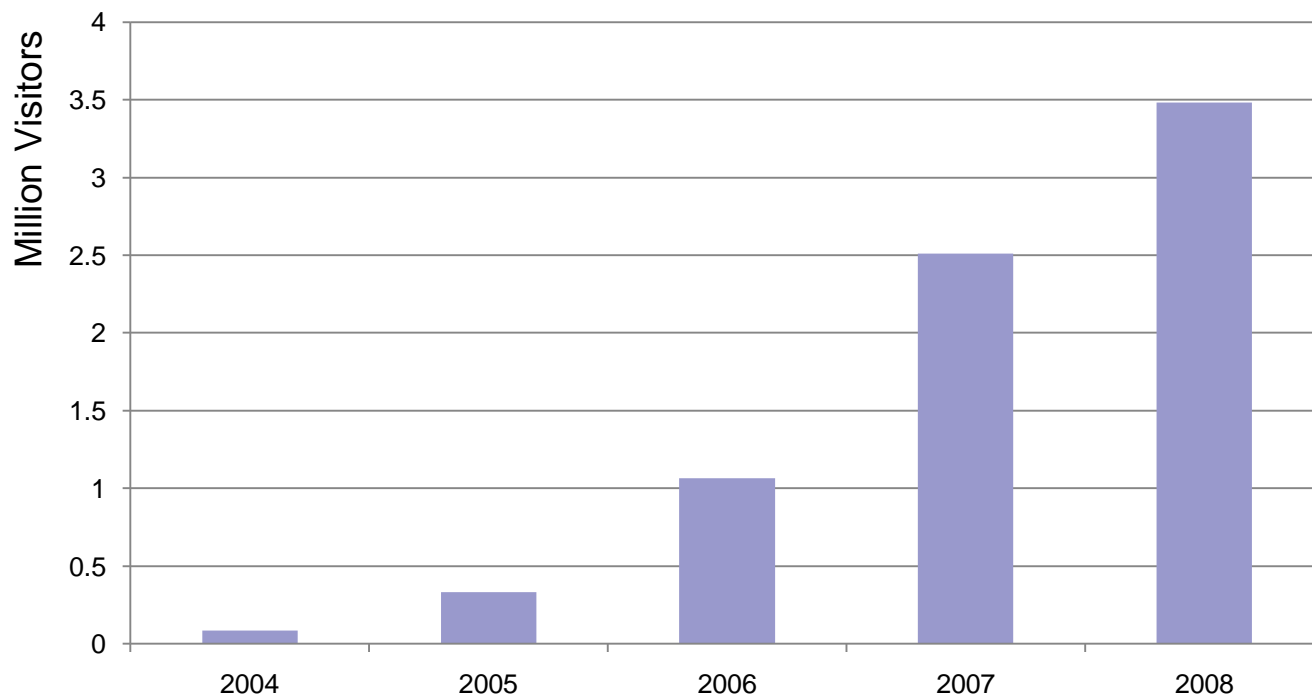


Open Source > Freely Available

- Available free of charge for everyone in Schools and at Home
- Online Collaboration
 - International Community
 - [User Forum](#) – Users help Users
 - [GeoGebraWiki](#) – Pool of Shared Materials
- Expandable
 - by using other Open Source Libraries



Visitors on www.geogebra.org

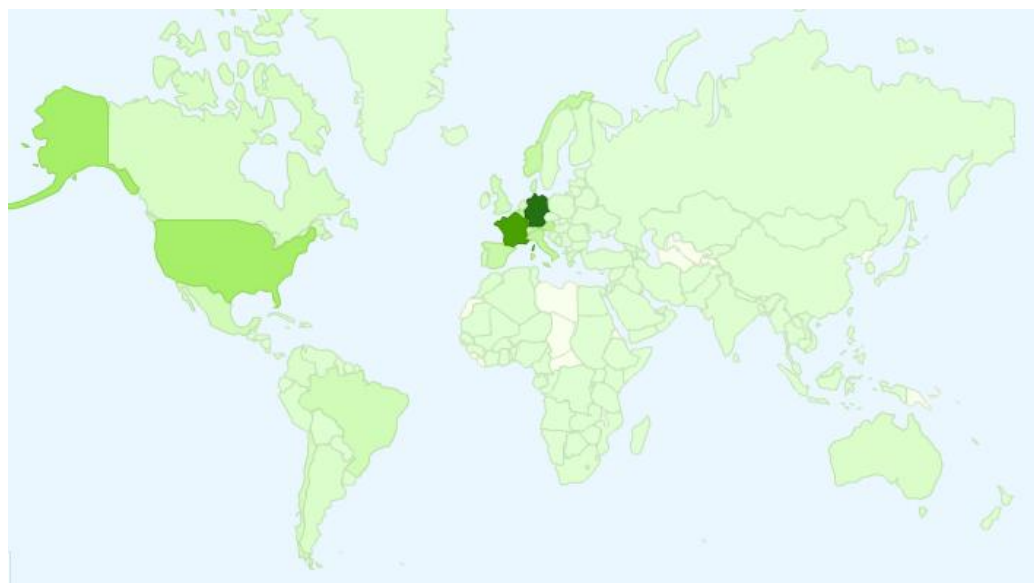


- Up to 15.000 Visitors / Day
- Up to ½ Million Visitors / Month



Behind the Scenes

- 5 Core Developers
- 15 Contributors
- 45 languages
- 100 Translators
- 190 countries
- 8500 Learning Objects





International
GeoGebra Institute
since 2008



International GeoGebra Institute

- Goals of IGI (www.geogebra.org/igi)
 - Teacher training and support
 - Material and software development
 - Research projects and collaboration
- Local GeoGebra Institutes in
Austria, Brazil, Denmark, Hungary, Norway,
Poland, Portugal, Spain, Turkey, UK, USA
- MSOR Connections special issue, Book “Model Centered Learning”, GeoGebra Conference



Thank you!

- GeoGebra
www.geogebra.org
- International GeoGebra Institute
www.geogebra.org/igi
- Slides of this talk
www.geogebra.org/talks
- Markus Hohenwarter
markus@geogebra.org