



Copyright © 2006-2007 Particio BT.  
Z. Kovacs, R. Vajda, A. Fekete, G. Bakos, K. Csarnai

Powered by WebMathematics Interactive 2.1.5  
(2009-07-06)

Copyright © 2002-2007 University of Szeged

Database powered by Wekker RAD Engine  
Copyright © 2005-2007 Consol Kft.

Graphics powered by Gnome  
Logo copyright © 2003 Zsigmond Kovacs  
Color designation by Zsuzsa Deak  
4D cube animation by Oliver Knill, Harvard University  
Punk girl logo © www.sykospark.net  
Spiral image from Wikipedia © Chris 73  
Number theory logo © Zoltan Medve

Underlying software:

# WebMathematics Interactive

# 2

A graphical user interface to  
computer algebra systems  
for students

**Zoltán Kovács**

Dept. of Analysis

University of Szeged, Hungary



Copyright © 2006-2007 Particio BT.  
Z. Kovacs, R. Vajda, A. Fekete, G. Bakos, K. Csarnai

Powered by WebMathematics Interactive 2.1.5  
(2009-07-06)

Copyright © 2002-2007 University of Szeged

Database powered by Wekker RAD Engine  
Copyright © 2005-2007 Consol Kft.

Graphics powered by Gnome  
Logo copyright © 2003 Zsigmond Kovacs  
Color designation by Zsuzsa Deak  
4D cube animation by Oliver Knill, Harvard University  
Punk girl logo © www.sykospark.net  
Spiral image from Wikipedia © Chris 73  
Number theory logo © Zoltan Medve

Underlying software:

# Why yet another math software?

## Most computer algebra systems...

- are **non-free**
- have no full **internationalized** (localized) version
- have different and difficult **syntax** (even for teachers, not only for students!)
- start too slow (even on recent machines)
- have big **memory demand** (for parallelly run other software as well)
- react to user questions sometimes **slow** (depending on the running machine)



Copyright © 2006-2007 Particio BT.  
Z. Kovacs, R. Vajda, A. Fekete, G. Bakos, K. Csernai

Powered by WebMathematics Interactive 2.1.5  
(2009-07-06)

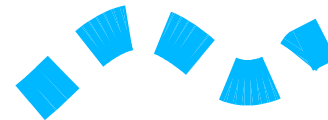
Copyright © 2002-2007 University of Szeged

Database powered by Wekker RAD Engine  
Copyright © 2005-2007 Consol Kft.

Graphics powered by Gnome  
Logo copyright © 2003 Zsigmond Kovacs  
Color designation by Zsuzsa Deak  
4D cube animation by Oliver Knill, Harvard University  
Punk girl logo © www.sykospark.net  
Spiral image from Wikipedia © Chris 73  
Number theory logo © Zoltan Medve

Underlying software:

# By contrast...



## WMI2...

- is **free** and using **free modules** (Maxima, gnuplot, LaTeX, PostgreSQL, PHP, Apache, Linux)
- offers open standards for complete **localization**
- uses a common, **easy syntax** (which can be described in not more than 10 sentences)
- on broadband internet connection it starts always **very fast** (independently of the machine)
- has very **low memory** demand on client machines
- on broadband internet connection it reacts very fast





matek.hu BETA



Copyright © 2006-2007 Particio BT.  
Z. Kovacs, R. Vajda, A. Fekete, G. Bakos, K. Csarnai

Powered by WebMathematics Interactive 2.1.5  
(2009-07-06)

Copyright © 2002-2007 University of Szeged

Database powered by Wekker RAD Engine  
Copyright © 2005-2007 Consol Kft.

Graphics powered by Gnome  
Logo copyright © 2003 Zsigmond Kovacs  
Color designation by Zsuzsa Deak  
4D cube animation by Oliver Knill, Harvard University  
Punk girl logo © www.sykospark.net  
Spiral image from Wikipedia © Chris 73  
Number theory logo © Zoltan Medve

Underlying software:

# What is WMI2 exactly?

A graphical user interface for the Maxima CAS and the gnuplot function plotter, and...

- focuses on **calculator-like functions** (>70 actions)
- saves calculations on a **worksheet**
- offers an **intuitive web interface** on-line 7/24
- has an automatic **formula syntax corrector** and converter
- defines 6 different **layouts** for different groups of students (school types and object categories)
- is available in **10 languages** (English, German, French\*, Italian, Chinese\*\*, Czech, Slovak, Serbian and Hungarian)



matek.hu BETA



Copyright © 2006-2007 Particio BT.  
Z. Kovacs, R. Vajda, A. Fekete, G. Bakos, K. Csarnai

Powered by WebMathematics Interactive 2.1.5  
(2009-07-06)

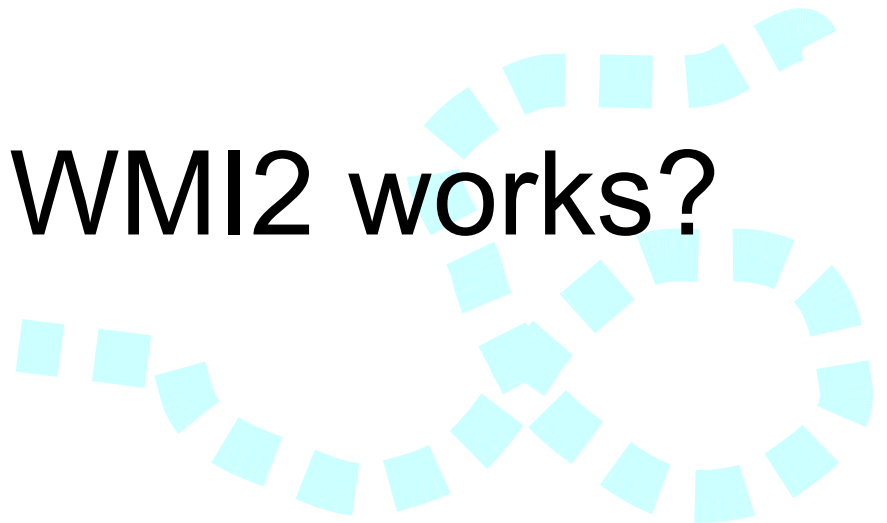
Copyright © 2002-2007 University of Szeged

Database powered by Wekker RAD Engine  
Copyright © 2005-2007 Consol Kft.

Graphics powered by Gnome  
Logo copyright © 2003 Zsigmond Kovacs  
Color designation by Zsuzsa Deak  
4D cube animation by Oliver Knill, Harvard University  
Punk girl logo © www.sykospark.net  
Spiral image from Wikipedia © Chris 73  
Number theory logo © Zoltan Medve

Underlying software:

# How WMI2 works?



- The server software is installed on a **remote server** machine (or more machines, using load balancing)
- The user on the client side downloads a minimal **HTML/Javascript** code for interaction to the server
- All computations and formula generation are done on server side
- Only displaying formulas and graphs (both as images) are done by the **browser** on client side
- The server side is **caching** all queries (both questions and answers) to efficiently serve classroom usage



# Do similar free projects already exist?

In general: no, but...

- **SAGE**: web based math worksheet editor
- **WxMaxima**: internationalized Maxima
- many web based and native application calculators
- **GeoGebra**: webstart (Java based)
- **MAW** (Mathematics Assistant on the Web)
- **jsMath**, **ASCIIMathML** (JavaScript formula editors)
- **DragMath** (Java formula editor)

Copyright © 2006-2007 Particio BT.  
Z. Kovacs, R. Vajda, A. Fekete, G. Bakos, K. Csarnai

Powered by WebMathematics Interactive 2.1.5  
(2009-07-06)

Copyright © 2002-2007 University of Szeged

Database powered by Wekker RAD Engine  
Copyright © 2005-2007 Consol Kft.

Graphics powered by Gnome  
Logo copyright © 2003 Zsigmond Kovacs  
Color designation by Zsuzsa Deak  
4D cube animation by Oliver Knill, Harvard University  
Punk girl logo © www.sykospark.net  
Spiral image from Wikipedia © Chris 73  
Number theory logo © Zoltan Medve

Underlying software:





matek.hu BETA



Copyright © 2006-2007 Particio BT.  
Z. Kovacs, R. Vajda, A. Fekete, G. Bakos, K. Csernai

Powered by WebMathematics Interactive 2.1.5  
(2009-07-06)

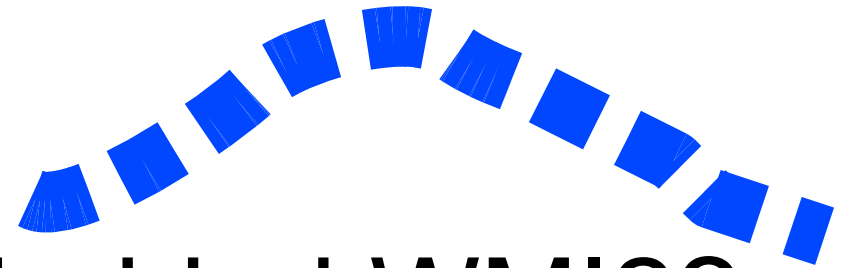
Copyright © 2002-2007 University of Szeged

Database powered by Wekker RAD Engine  
Copyright © 2005-2007 Consol Kft.

Graphics powered by Gnome  
Logo copyright © 2003 Zsigmond Kovacs  
Color designation by Zsuzsa Deak

4D cube animation by Oliver Knill, Harvard University  
Punk girl logo © www.sykospark.net  
Spiral image from Wikipedia © Chris 73  
Number theory logo © Zoltan Medve

Underlying software:



# Who is behind WMI2?

- **University of Szeged, Bolyai Institute**  
(demand, testing, teacher experts)
- **Particio.com**, a for-profit company  
(development, web installations,  
management, support)
- Contributor students and colleagues





matek.hu BETA



Copyright © 2006-2007 Particio BT.  
Z. Kovacs, R. Vajda, A. Fekete, G. Bakos, K. Csernai

Powered by WebMathematics Interactive 2.1.5  
(2009-07-06)

Copyright © 2002-2007 University of Szeged

Database powered by Wekker RAD Engine  
Copyright © 2005-2007 Consol Kft.

Graphics powered by Gnome  
Logo copyright © 2003 Zsigmond Kovacs  
Color designation by Zsuzsa Deak  
4D cube animation by Oliver Knill, Harvard University  
Punk girl logo © www.sykospark.net  
Spiral image from Wikipedia © Chris 73  
Number theory logo © Zoltan Medve

Underlying software:

# Who uses WMI2?



- **University of Szeged, Hungary:** BSc/BA education
- **Brno University, Czech Republic:** Bsc education
- **University of Komárno, Slovakia:** Bsc education
- **Chang Gung University, Taiwan:**  
medical education (introductory mathematics)

## How about you?

