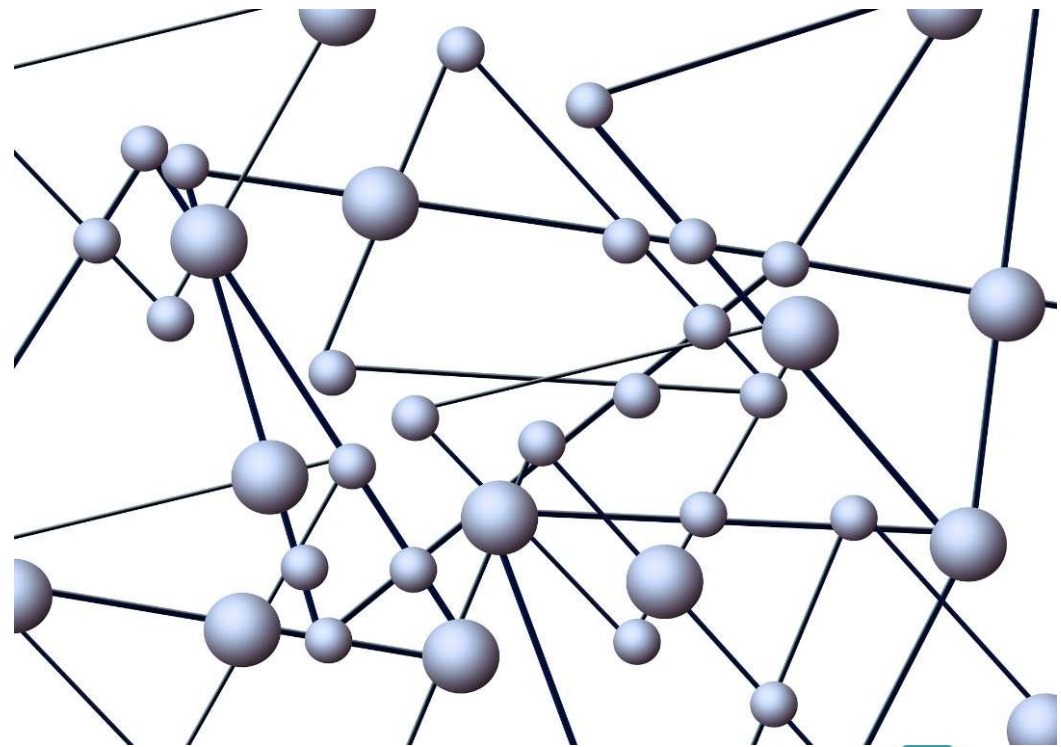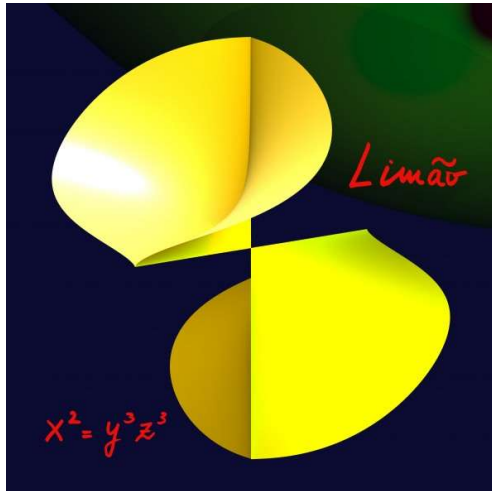# Digital Support for Math Assessment in HE in Rhineland-Palatine

N_μ

Dr. Ingo Dahn.
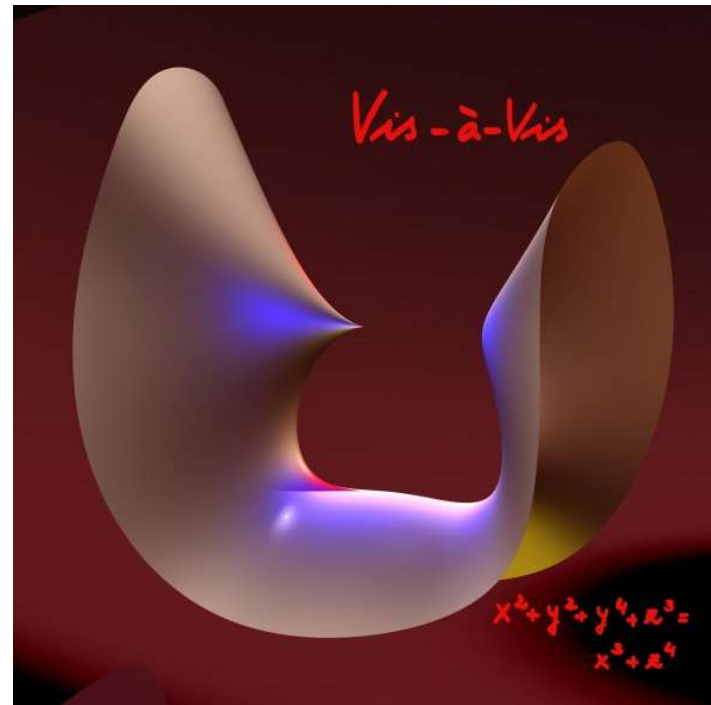
VCRP

What can you expect?

- **Higher Education in Rhineland-Palatine**
- **The Virtual Campus (VCRP)**
- **Math Services for University Staff**
  - IMathAS
  - Test Analysis
  - NetMath
  - CoCalc
  - Registry

Education in Germany

- Federal Republic Germany
- Education controlled by the lands
- Freedom of teaching and research!
- No tuition fees at public universities
- Strong support for Open Source and OER

HE in Rhineland-Palatine

- 13 public universities
- Virtual Campus (VCRP) as Organization of these universities
- Digital services
  - LMS, Video-Server,...
- Technical and didactic support (2nd level)

For Math Assessment:

- IMathAS
  - 1 server for all universities
  - 1 question library for all
  - Integrated into central LMS Open OLAT
- Central 1st Level Support
  - Mail, Forum, Workshops
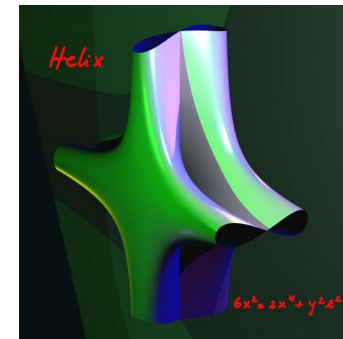- NetMath for related news
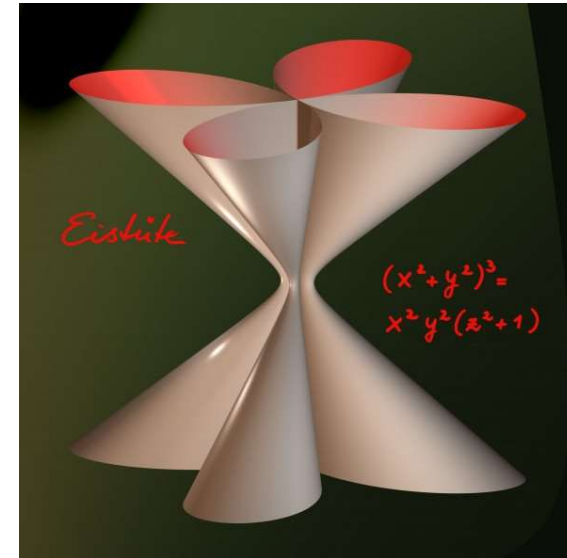
The NetMath Philosophy

- Instructors have full responsibility for their teaching
- No curation of questions, tests or courses
- Everything is private unless it is made public
- Reuse is encouraged but not enforced
- Reuse as-is or as template
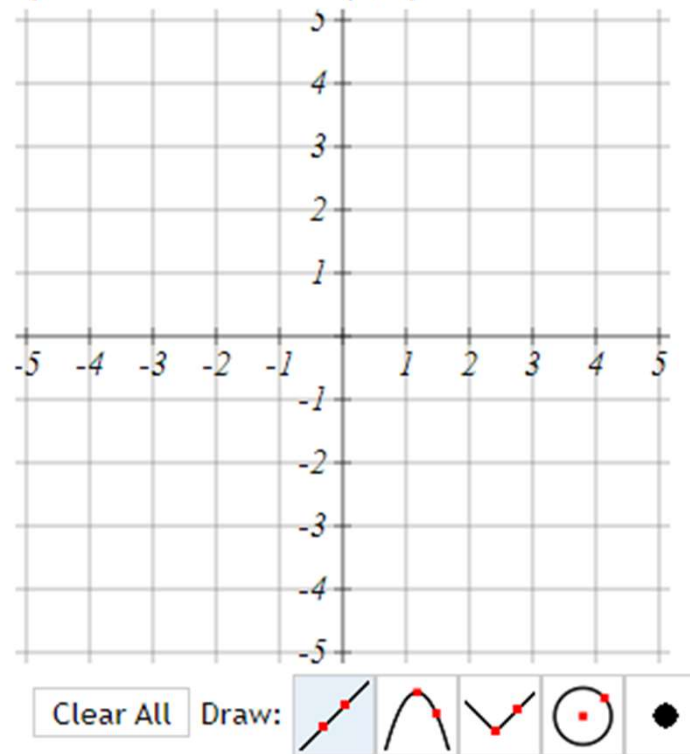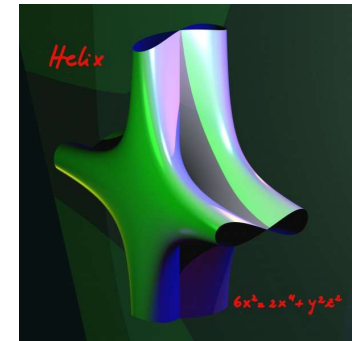- Liberal licensing (Standard like CC-By)

IMathAS - Question

Draw a graph that includes:

1) The line $y = \dfrac{1}{2}x + 2$,

2) The parabola $y = (x + 3)^2 - 2$, and

3) a circle centered at (3,-1) with radius 2

Clear All | Draw:

IMathAS - Code

Writing Questions Help | Macro Library Help

Common Control: [+][-] [Solver] [Save] [Quick Save and Preview]

```
1  $answerformat = "twopoint"
2  $answers[0] = ".5x+2"
3  $answers[1] = "circle,3,-1,2"
4  $answers[2] = "(x+3)^2-2"
5
6  $reltolerance = 2
```

Question Text: [+][-] [Toggle Editor] [Save] [Quick Save and Preview]
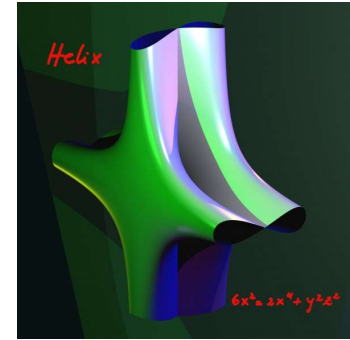
```
Draw a graph that includes: <br/>
1) The line `y = 1/2x + 2`,<br/>
2) The parabola `y = (x+3)^2-2`, and <br/>
3) a circle centered at (3,-1) with radius 2
```

IMathAS Features

- 21 types of (randomized) questions
- 6 types of assessments, including video cued and poll
- Extensible by macro libraries for specific topics, SageCell, JSXGraph, Geogebra,...
- Upload of handwritten solutions
- Help and feedback
- Solution of a similar problem, detailed

Test-Analyzer

- For instructors
- Analyses/visualises test results
- Detects anomalies
- Provides advice for teaching
- Supports partitioning students into workgroups
- Directly from the IMathAS gradebook
- In German and English
- For IMathAS and Open OLAT, OPAL, ILIAS

Test-Analyzer

https://netmath.vcrp.de/services/testanalyzer/#/imathas
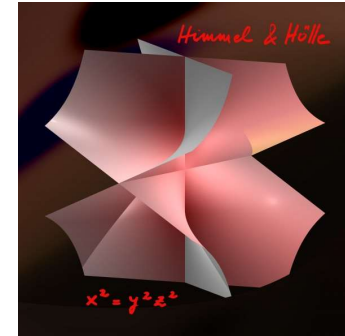
IMathAS Test Analysis

- Data
- **Score Distribution**
- **High Scored**
- Low Scored
- Unattempted
- Best Students
- Question Statistics
- Item Discrimination

...a

...est has 10 questions. There are data from 42 students. A maximum of 100 points can
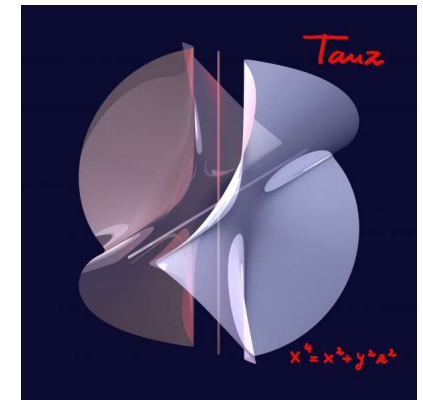
...ore Distribution

Students

Links

- *VCRP:*
  - *https://vcrp.de*
- *IMathAS:*
  - *https://www.imathas.com/*
- *Testanalyzer:*
  - *https://netmath.vcrp.de/services/testanalyzer/#/imathas*
- *Survey on Math Assessment Systems in Germany:*
  - *https://dahn-research.eu/Survey/*

Thank You for Your Interest

- Contact and Info:
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  - https://dahn-research.eu