# KeTCindyJS and KeTLMS

Various Applications in Mathmatics Classes

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Decmber 8th-11th, 2024

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## Abstract

- We have created some examples of effective teaching materials for mathematics classes using KeTCindyJS and KeTLMS.

- KeTCindyJS allows anyone to easily create HTML containing interactive figures by linking the dynamic geometry software Cinderella and CindyJS.

- KeTLMS is an HTML app that enables students who are not familiar with TeX to easily exchange questions and answers, including mathematical formulas.

- As examples, we will show how to make the following HTML
    1. Gaussian elimination method
    2. Displaying the n-th root of a complex number
    3. SIR model of infectious diseases

## Background

- Now that the digitalization of education has progressed, ICT utilization and education using the Web are in demand.

- There is a need for inquiry-based online educational materials that allow students to actively solve problems on their own.

$$\Downarrow$$

We have created some examples of effective teaching materials for mathematics classes using KeTCindyJS and KeTLMS.

## KeTCindy

- Support System for Creating Geometric Teaching Materials
  - Plug-in to create illustrations using dynamic geometry software Cinderella2
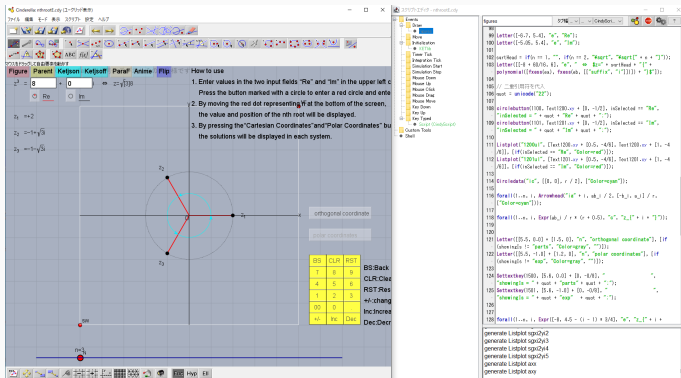  - Developed by a group led by Setsuo Takato



**Figure 1:** KeTCindy (left: dynamic geometry screen, right: script editor screen)

# KeTCindyJS

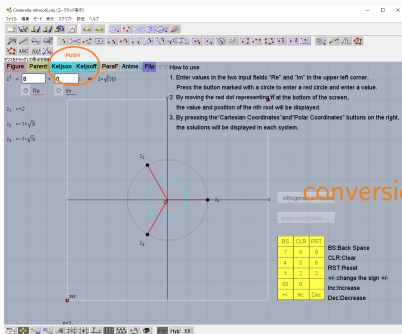- A system that can create diagrams and graphs using KeTCindy libraries and generate them as HTML files
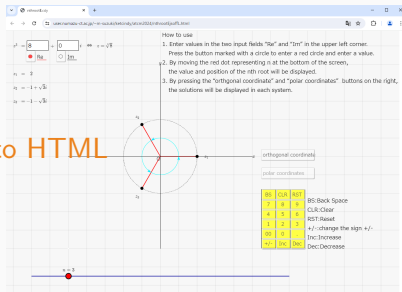


**Figure 2:** KeTCindyJS

conversion to HTML
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**Figure 3:** HTML files

## Information about KeTCindy

- KeTCindy Home (Official Site)
  https://s-takato.github.io/ketcindyorg/indexe.html
- KeTCindy Web Docs
  https://ketcindy-web-docs.vercel.app/
  - Auto Installer
  - Web Reference
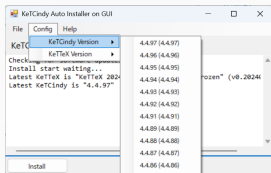  - KeTCindy Chat



**Figure 4:** Installer    **Figure 5:** Reference    **Figure 6:** Chat

## KeTLMS

- System for exchanging assignments using KeTMath mathematical formulas
  - A series of processes from question creation, distribution, collection, grading, and return are possible.
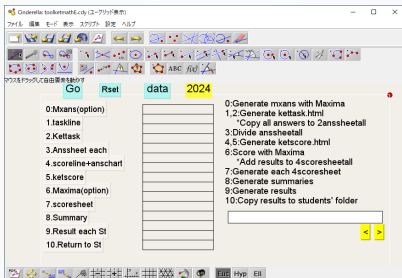  - Developed by a group led by Setsuo Takato
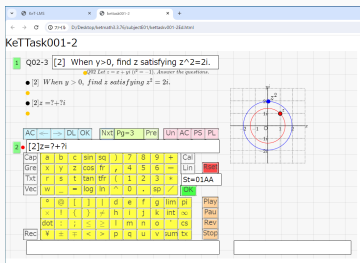


**Figure 7:** Teacher side



**Figure 8:** Student side

- See 「KetCindy HOME」 for how to use KeTLMS
  - What you prepare is the student's data, the question's data and embed data, if you want to include a figure.
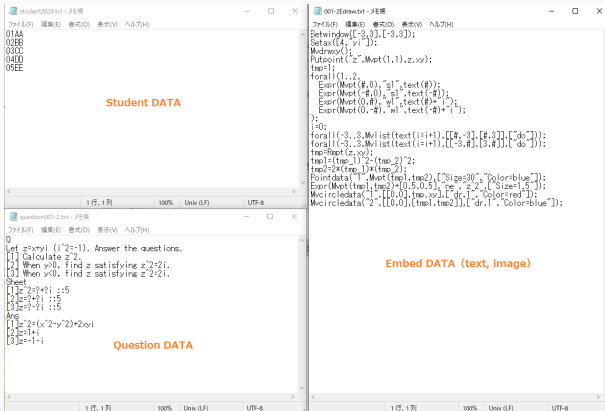


**Figure 9:** What you need for KeTLMS

## How to embed

- See 「KetCindy HOME」 for how to use KeTLMS
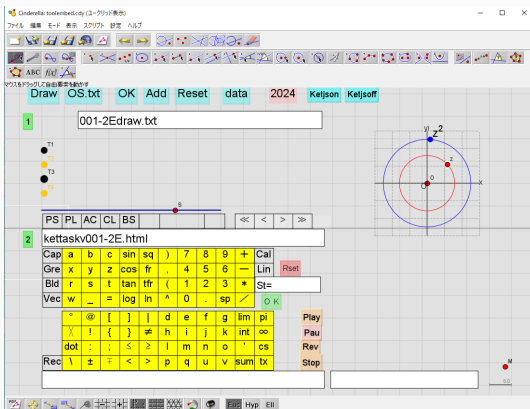  - Set up using toolembed.cdy



**Figure 10:** toolembed.cdy

## Let's try

- KeTLMS at ACTM2024 (by KUBO)
  https://kubo-yuge.github.io/atcm2024/
- KeTCindy at ACTM2024 (by SUZUKI)
  https://user.numazu-ct.ac.jp/ m-suzuki/ketcindy/atcm2024.html
- kame-els K12 for KeTLMS Worksop (by KAMEDA)
  https://k12.kame-els.com/

**Figure 11:** KUBO        **Figure 12:** SUZUKI        **Figure 13:** KAMEDA