Development of methods for interactive classes using KeTLMS

Koji Nishiura, Setsuo Takato

2024.12.10 ATCM2024

Contents of this talk

- Purpose of this research

Contents of this talk

- Purpose of this research
- KeTLMS

Contents of this talk

- **Purpose of this research**
- **KeTLMS**
- **Making teaching materials by KeTLMS**

Contents of this talk

- Purpose of this research
- KeTLMS
- Making teaching materials by KeTLMS
- Teaching materials

Contents of this talk

- Purpose of this research
- KeTLMS
- Making teaching materials by KeTLMS
- Teaching materials
- Concluding remarks

Purpose of this research

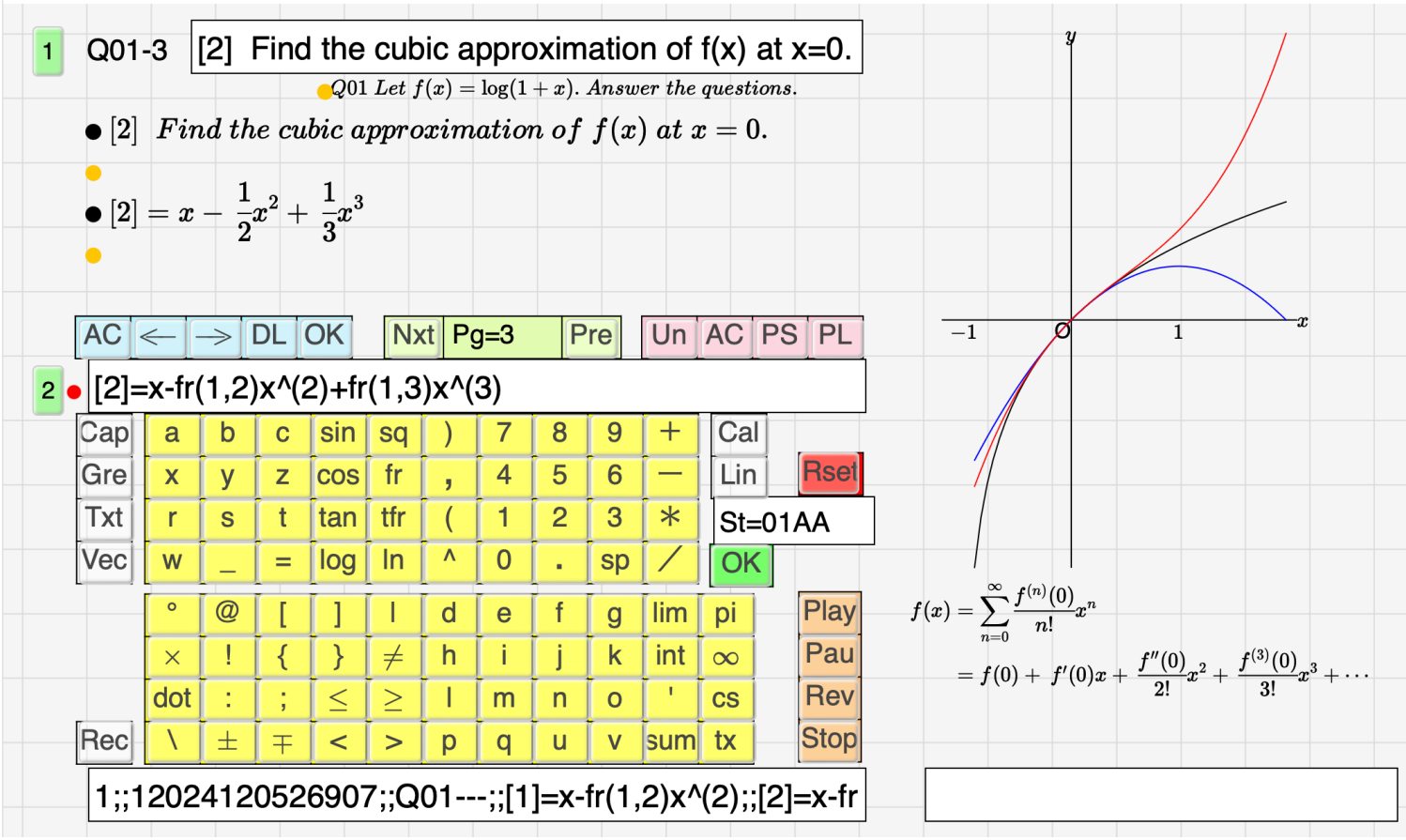
We are developing an LMS called KeTLMS. Using KeTLMS, we will create teaching methods that allow us to objectively assess students' levels of understanding while conducting the class, based on verification of its educational effectiveness.

KeTLMS

KeTLMS is a system designed to streamline the process of teachers creating and distributing questions, while students receive the questions and submit their answers. Additionally, it allows teachers to collect and grade the answers efficiently.

KeTLMS

KeTTask01-1



An important feature of the system is that both questions and answers are formatted as a single line of text.

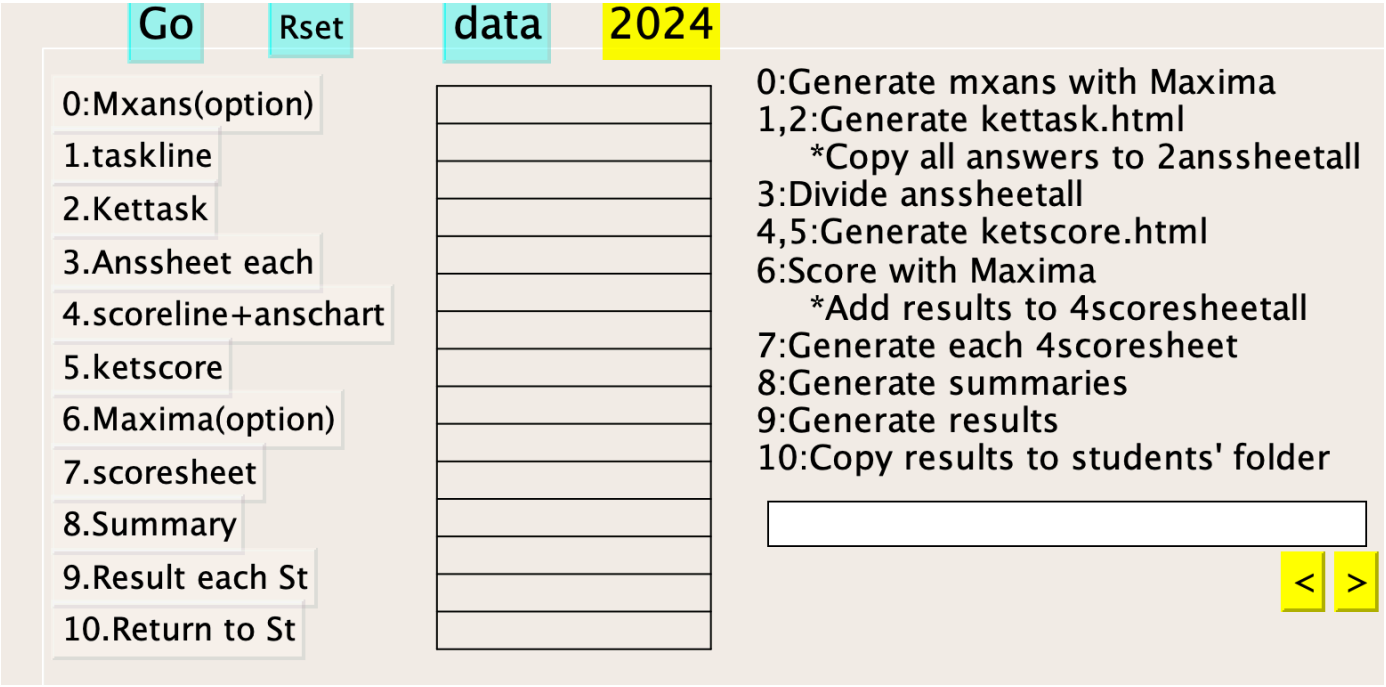
Making teaching materials by KeTLMS

1. **Create a question file, 'question01-1.txt'.**

```
Q
Let f(x)=log(1+x). Answer the questions.
[1] Find the quadratic approximation of f(x) at x=0.
[2] Find the cubic approximation of f(x) at x=0.
Sheet
[1]=? ::5
[2]=? ::5
Ans
[1] x-fr(1,2)x^(2)
[2] x-fr(1,2)x^(2)+fr(1,3)x^(3)
```

Making teaching materials by KeTLMS

2. Create a question file, ‘kettaskv01-1E.html’ by pressing bottuns ‘1.taskline’ and ‘2.Kettask’ in ‘toolketmathE.cdy’.



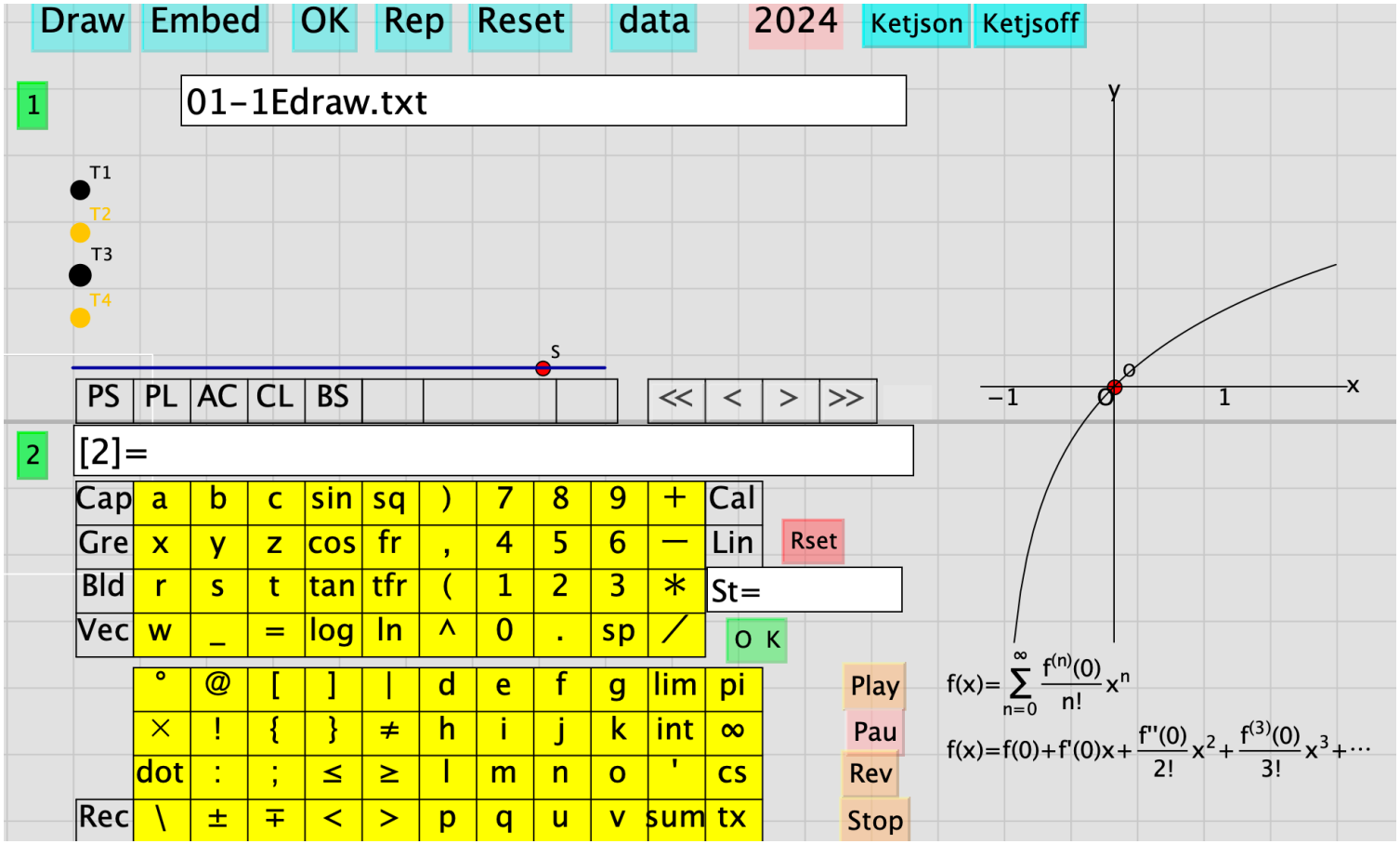
Making teaching materials by KeTLMS

3. Create a file to embed in ‘kettaskv01-1E.html‘, ‘001-1draw.txt’.

```
if(ketlibflg==1,
  str2="?";
  ketlibflg=0;
  flgp2=1;Defvar(["flgp2",flgp2]);
  flgp3=1;Defvar(["flgp3",flgp3]);
);
Setwindow([-1.2,2.1],[-2.3,2.6]);
if(nqu>1,
   Expr(Mvpt(-1.5,-2.7),"e",
        Totexform("f(x)=sum(n=0,{\infty},!fr(f^((n))(0),n!)x^n)"));
   Expr(Mvpt(-1.5,-3.3),"e",
        Totexform("\phantom{f(x)}=f(0)+f'(0)x+fr(f''(0),2!)x^2
                  +fr(f^((3))(0),3!)x^3+\cdots "));
);
Mvplotdata("1","log(1+x)","x=[-0.9,2]");
Expr(Mvpt(1,0),"s1","1");
Expr(Mvpt(-1,0),"s1","-1");
Mvdrwxy();
```

Making teaching materials by KeTLMS

4. Create an embedded file, ‘kettaskv01-1Ed.html’, using ‘toolembed.cdy’.



Teaching materials

We have created teaching materials on the differential coefficient, titled kettaskv001-1Ed.html and kettaskv001-2Ed.html.

These materials consist of explanations and questions.

Teaching materials

kettaskv001-1Ed.html, kettaskv001-2Ed.html

Teaching materials

File of answers : anschart001-1.csv

CA	2024	1		Q01---	[1]1	___	[2]4	5	[3]a+b	5
1	01C	1209	17:49:21	Q01---	[1]=1		[2]=4		[3]=a+b	
2	02C	1209	17:51:0	Q01---	[1]=1		[2]=4		[3]=a-b	
3	03C	1209	17:51:51	Q01---	[1]=1		[2]=4		[3]=a+b	
4	04C	1209	17:52:39	Q01---	[1]=1		[2]=4		[3]=a+b	
5	05C	1209	17:54:15	Q01---	[1]=0		[2]=3		[3]=b^(2) -a^(2)	

Teaching materials

File of answers : anschart001-1.csv

CA	2024	1		Q01---	[1]1	___	[2]4	5	[3]a+b	5
1	01C	1209	17:49:21	Q01---	[1]=1		[2]=4		[3]=a+b	
2	02C	1209	17:51:0	Q01---	[1]=1		[2]=4		[3]=a-b	
3	03C	1209	17:51:51	Q01---	[1]=1		[2]=4		[3]=a+b	
4	04C	1209	17:52:39	Q01---	[1]=1		[2]=4		[3]=a+b	
5	05C	1209	17:54:15	Q01---	[1]=0		[2]=3		[3]=b^(2) -a^(2)	

The teacher will check the answers given by the students and then move on to the next explanation.

Concluding remark

We can easily create interactive teaching materials with KeTLMS, and we will assess their effectiveness from now on.