An overview of the schl package

Tassos Tsesmetzis

schl is a XeLaTeX package that provides commands and environments suitable for document types that appear in a classroom enviromnent. It's development is based on the Greek school educational practice, but it may be usefull in other contexts also. This document offers a quick view of working examples for schl's marcos. If we load the package passing the parameter greek, several macros will be printed in Greek. These are defined in languages/sch-greek.def. If you want to set them in a different language modify the languages/sch-template.def file.

1. Blank space is designated with the macros \lowerdots and \blankspace.

```
Fill the small spaces \lowerdots{3} and
\blankspace{2em}.
```

Fill the small spaces ... and ____ .

```
Fill this bigger space\lowerdots{20}.\\
And this one \blankspace{15em}.
```

Fill this bigger space.....
And this one _____ .

```
Change the vertical position \lowerdots[0.5ex]{10}
     and \blankspace[-2.0ex]{5em}.
```

Change the vertical position ····· and _____ .

```
Also in mathematical expressions
$\cos\frac\pi4 = \lowerdots{4}$
and $\cos\frac\pi4 = \blankspace{2em}$.
```

Also in mathematical expressions $\cos\frac{\pi}{4} = \ldots$ and $\cos\frac{\pi}{4} =$ ____.

2. With the environment exercise you can typeset exercises.

```
\begin{exercise}
\item Write all prime integers that are less or
     equall to $100$.
\item We 've bought $120$ watermelons from a local
     grocery shop. The total weight was $360\, kg$
     and the watermelons were sold for $0.5\euro$
     per $kg$. The grocer was highly delighted from
     this and decided to dedicate himself to the
     black art of Mathematics. Furthermore, he
     offered as a $2.5\%$ discount. How much money
     did we gave for the watermelons?
\item Prove that the sum of the angles of a triangle
      equals $180^\circ$.
\end{exercise}
```

Exercise 1. Write all prime integers that are less or equall to 100.

Exercise 2. We 've bought 120 watermelons from a local grocery shop. The total weight was $360\,kg$ and the watermelons were sold for $0.5€$ per kg. The grocer was highly delighted from this and decided to dedicate himself to the black art of Mathematics. Furthermore, he offered as a 2.5% discount. How much money did we gave for the watermelons?

Exercise 3. Prove that the sum of the angles of a triangle equals 180°.

3. The environment schltask can be used for summative tests.

```
\begin{schltask}
\item Solve the equation $x^2 - 3x + 2 = 0$.
\item Prove the Pythagorean theorem.
\item Prove that the medians of a triangle have a
     common point.
\end{schltask}
```

TASK 1 Solve the equation $x^2 - 3x + 2 = 0$.

TASK 2 Prove the Pythagorean theorem.

TASK 3 Prove that the medians of a triangle have a common point.

4. The macro \answer is used to typeset the answer of an exercise.

```
\begin{exercise}
\item Find the sum $1 + 1$.\answer[\hfill\
     footnotesize]{2}
\end{exercise}
```

Exercise 1. Find the sum $1 + 1$. (Uns.: 2)

5. With the macro \solution, we write the solution of an exercise.

```
\begin{exercise}
\item Prove that there are infinite prime numbers.
 \solution{%
   Assume that there is a finite number of primes $
       p_1,\ldots,p_\nu$. Define the integer\ldots}
\end{exercise}
```

Exercise 1. Prove that there are infinite prime numbers.

Solution

Assume that there is a finite number of primes $p_1, \ldots, p_\nu$. Define the integer...

6. Set points to exercises with the macro `\points`:

```
\begin{schltask}
\item \points{25}\par
 Prove the theorem of Bolzano.
\item \points{11}\par
 Let $f:\mathbb{R}\rightarrow\mathbb{R}$ be a
      function with $f(x) = \frac1{x-1}$.
 \begin{enumerate}
 \item \points[\itshape]{10} Find its domain.
 \item \points[\itshape]{1} Calculate the value $f
      (3)$.
 \end{enumerate}
\end{schltask}
```

TASK 1 **(points 25)**

Prove the theorem of Bolzano.

TASK 2 **(points 11)**

Let $f : \mathbb{R} \to \mathbb{R}$ be a function with $f(x) = \frac{1}{x-1}$.

(α′) *(points 10)* Find its domain.

(β′) *(point 1)* Calculate the value $f(3)$.

7. Environment `question`:

```
\begin{question}
 \item Is there a biggest real number?
 \item Is there a smallest positive real number?
\end{question}
```

Question 1. Is there a biggest real number?

Question 2. Is there a smallest positive real number?

8. Hints with the macro `\hint`:

```
\begin{exercise}
\item Prove that between two rational numbers ,there
      is a rational.
  \hint[\par\noindent\scriptsize]{%
    Assume rationals $\rho_1 < \rho_2$. We define
        the real number $\frac{\rho_1 + \rho_2}2$.
        Then, $x$ is\ldots}
\item Prove that $(\alpha + \beta)^2 = \alpha^2 + 2
     \alpha \beta + \beta^2$.
  \hint[\par\noindent\scriptsize]{%
    We have $(\alpha + \beta)^2 = (\alpha + \beta) \
        cdot (\alpha + \beta) = \ldots$}
\end{exercise}
```

Exercise 1. Prove that between two rational numbers ,there is a rational.

Hint: Assume rationals $\rho_1 < \rho_2$. We define the real number $\frac{\rho_1+\rho_2}{2}$. Then, x is...

Exercise 2. Prove that $(\alpha + \beta)^2 = \alpha^2 + 2\alpha\beta + \beta^2$.

Hint: We have $(\alpha + \beta)^2 = (\alpha + \beta) \cdot (\alpha + \beta) = \ldots$

9. Environment `multichoice` is for multiple choice questions:

```
\begin{multichoice}
\item choice 1
\item choice 2
\item choice 3
\end{multichoice}
```

A′. choice 1 B′. choice 2 Γ′. choice 3

Another example

```
\begin{multichoice}[before=\hspace{3em},itemjoin=\
    hspace{3em},label=\bf\arabic*{})]
\item A long choice
\item A longer choice\\\hspace*{9em}
\item An even longer choice
\end{multichoice}
```

1) A long choice **2)** A longer choice
3) An even longer choice

10. Environment `tickchoice`. Horizontal

```
\begin{tickchoice*}
\item choice A
\item choice B
\item choice C
\end{tickchoice*}
```

☐ choice A ☐ choice B ☐ choice C

and vertical

```
\begin{tickchoice}
\item choice A
\item choice B
\item choice C
\end{tickchoice}
```

☐ choice A
☐ choice B
☐ choice C

11. A wish for good luck

```
\wish
```

Good luck!

Setting the text. Macro `\letterspace` sets the space between adjucent letters

```
\makeatletter
\def\schl@wish{\letterspace{10} Let the power be
    with you!}
\makeatother
\wish
```

Let the power be with you!

12. Write the name and date:

```
\fullname\\
\datefield
```

Fullname:
Date:

Also, with dots or a line for blank space:

```
\fullname{\lowerdots{40}}\\
\datefield{\blankspace{10em}}
```

Fullname: .....
Date: _____

We could use

```
\setdate{May 28, 2020}
\datefield{\getdate}
```

Date: May 28, 2020

13. Exercise deadline:

```
\deadline{2/2/2058}
```

Deadline: 2/2/2058

14. Set the duration of a test:

```
\duration{10'} or\\
\duration[\it]{10'} or\\
\duration[\rm]{10'}
```

Duration: 10' or
Duration: 10' or
Duration: 10'

15. Add a remark in a document:

```
\remark{A remark starts here\ldots}\\
\remark[\rm]{Another one.}\\
\remark[\it]{Another one.}
```

Remark: A remark starts here...
Remark: Another one.
Remark: Another one.

16. Add a reminder in a document:

```
\reminder{Write a reminder\ldots}\\
\reminder[\mdseries]{Write another one\ldots}
```

Reminder: Write a reminder...
Reminder: Write another one...

17. Header for the theory part of a document:

```
\theorypart
```

THEORY

Header for the exercise part of a document:

```
\exercisepart
```

EXERCISES

18. Set the title of a worksheet

```
\worksheethd

or

\worksheethd{for paragraph \S A.2.3}
```

Worksheet

or

Worksheet for paragraph §A.2.3

19. Teacher/headmaster signatures:

```
\signatures{Georg Cantor}
\hfill
\signatures[Teachers]{First Teacher,Second Teacher}
```

Headmaster	Teachers
Georg Cantor	First Teacher
	Second Teacher

20. Headers for tests:

```
\examhd{}
\examhd{on fractions}
\examhd[Summative Test]{on chapter 1}
```

Test
Test on fractions
Summative Test on chapter 1

21. Header for end year summative tests:

```
\finalexamhd{WRITTEN}{MAY -- JUNE}
```

WRITTEN EXAMS
PERIOD MAY – JUNE

22. School logo

```
\school{KRONOS HIGH}
\grade{7th Grade}
\subject{Mathematics}
\teacher{Georg Cantor}
\schoollogo{200pt}
```

KRONOS HIGH
7th Grade
Mathematics
Georg Cantor

23. True-false type questions with the environment `truefalse`

```
\begin{truefalse}
\item Every real number is an integer.
\item A local maximum of a continuous function $f$
     on $\mathbb{R}$, is always greater than a local
      minimum.
\item The number $\pi$ is rational.
\end{truefalse}
```

1. Every real number is an integer. T F
2. A local maximum of a continuous function f on $\mathbb{R}$, is always greater than a local minimum. T F
3. The number π is rational. T F

24. `truefalse*` is a variant of `truefalse`.

```
\begin{truefalse*}
\item Every real number is an integer.
\item A local maximum of a continuous function $f$
     on $\mathbb{R}$, is always greater than a local
      minimum.
\item The number $\pi$ is rational.
\end{truefalse*}
```

T F

1. Every real number is an integer. ☐ ☐
2. A local maximum of a continuous function f on $\mathbb{R}$, is always greater than a local minimum. ☐ ☐
3. The number π is rational. ☐ ☐

25. Matching questions:

```
\setlist*[leftmatching]{label=}
\setlist*[rightmatching]{label=}
\setlength{\rightmatchwidth}{200pt}
\matchingque[280pt]{number,shape,color}{blue,green,
     square,integer,circle,cube}
```

number	blue
shape	green
color	square
	integer
	circle
	cube