schl package: An overview

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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.

We load the package with the option english:

```
\usepackage[english]{schl}
```

In this way several macros will be printed in English. These are defined in languages/schl-english.def. Currently, the package supports the options english and greek. Option greek is more complete.

To set the macros of the package in a different language, start by copying the languages/schl-template.def file. Rename it as languages/schl-<other-language>.def. Then, set the macros and modify accordingly the schl.dtx file.

A list of examples follows.

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]{5
    em}.
```

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 than $100$.
\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 than 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 $1 + 1$.\hfill\answer[\
    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. The environment `question` can be used to typeset a list of questions.

```
\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. Write 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. The environment `multichoice` is for multiple choice questions:

```
\noindent\begin{multichoice}
\item Choice 1
\item Choice 2
\item Choice 3
\end{multichoice}
```

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

Another example

```
\noindent\begin{multichoice}[before=\
    hspace{2em},itemjoin=\hspace{3em},
    label=\bf\arabic*{})]
\item A long choice
\item A longer choice\\\hspace*{3em}
\item An even longer choice
\end{multichoice}
```

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

10. Environment `tickchoice`. Horizontal alignment

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

☐ Choice A ☐ Choice B ☐ Choice C

and vertical

```
\noindent\begin{tickchoice}
\item Choice A
\item Choice B
\item Choice C
\end{tickchoice}
```

☐ Choice A
☐ Choice B
☐ Choice C

11. Type a wish for good luck with the macro `\wish`:

```
\wish
```

Good luck!

We can change the text by redefining the macro. The 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. With the macros `\fullname` and `datefield` we 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 can pass a date using the macros `\setdate` and `\getdate`.

```
\setdate{May 12, 2525}
\datefield{\getdate}
```

Date: May 12, 2525

13. Write a deadline with the macro `\deadline`

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

Deadline: 2/2/2058

14. Set the duration of a test with `\duration`

```
\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 with `\remark`

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

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

16. Add a reminder with `\reminder`:

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

Reminder: Write a reminder...
Reminder: Another one...

17. Add a header for the theory part of a document with `\theorypart`

```
\theorypart
```

THEORY

Add a header for the exercise part of a document with `\exercisepart`

```
\exercisepart
```

EXERCISES

18. Set the title of a worksheet with `\worksheethd`

```
\worksheethd

or

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

Worksheet

or

Worksheet for §A.2.3

19. Designate space for teacher(s)/headmaster signatures with the macro `\signatures`

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

Headmaster	Teachers
Georg Cantor	First Teacher
	Second Teacher

20. Headers for tests can be set with the macro `\examhd`

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

Test

Test on fractions

Summative Test on chapter 1

21. With `\finalexamhd` we can set a header for end year summative tests.

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

WRITTEN EXAMS
PERIOD MAY – JUNE

22. A school logo can be set with `\schoollogo`.

```
\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 can be set 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

`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.	☐	☐

24. The macro `\matchingque` can be used for matching questions

```
\setlist*[leftmatching]{label=}
\setlist*[rightmatching]{label=}
\matchingque[250pt]{number,shape,color}{
    blue,green,square,integer,circle,cube}
```

number	blue
shape	green
color	square
	integer
	circle
	cube