

An overview of the sch1 package

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sch1 is a \LaTeX package that provides commands and environments suitable for document types that appear in a classroom environment. It's development is based on the Greek school educational practice, but it may be useful in other contexts also. This document offers a quick view of working examples for sch1's macros. 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 this bigger space\lowerdots{20}. And this one \blankspace{15em}.
```

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

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

Fill the small spaces ... and ____ .

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

Change the vertical position and _____ .

Also in mathematical expressions $\cos \frac{\pi}{4} = \dots$ and $\cos \frac{\pi}{4} = \underline{\hspace{2em}}$.

2. With the environment `exercise` you can typeset exercises.

```
\begin{exercise}
\item Write all prime integers that are less or equal 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 $0.5\text{\euro}$ 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 equal 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  $p_1, \dots, p_n$ . 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, \dots, p_n . 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  $f(x) = \frac{1}{x-1}$ .
  \begin{enumerate}
\item \points[\itshape]{10} Find its domain.
\item \points[\itshape]{1} Calculate the value  $f(3)$ .
  \end{enumerate}
\end{schltask}
```

7. Environment question:

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

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}
```

9. Environment multichoice is for multiple choice questions:

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

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}
```

10. Environment tickchoice. Horizontal

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

and vertical

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

11. A wish for good luck

```
\wish
```

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

TASK 1

(points 25)

Prove the theorem of Bolzano.

TASK 2

(points 11)

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

(α') (points 10) Find its domain.

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

Question 1. Is there a biggest real number?

Question 2. Is there a smallest positive real number?

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 $(\alpha + \beta)^2 = (\alpha + \beta) \cdot (\alpha + \beta) = \ldots$

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

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

☐ choice A ☐ choice B ☐ choice C

☐ choice A
☐ choice B
☐ choice C

Good luck!

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

12. Write the name and date:

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

Also, with dots or a line for blank space:

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

We could use

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

13. Exercise deadline:

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

14. Set the duration of a test:

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

15. Add a remark in a document:

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

16. Add a reminder in a document:

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

17. Header for the theory part of a test:

```
\theorypart
```

Header for the exercise part of a test:

```
\exercisepart
```

18. Set the title of a worksheet

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

19. Teacher/headmaster signatures:

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

Let the power be with you!

Fullname:
Date:

Fullname:
Date: _____

Date: May 28, 2020

Deadline: 2/2/2058

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

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

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

THEORY

EXERCISES

Worksheet

or

Worksheet for paragraph §A.2.3

Headmaster

Georg Cantor

Theachers

First Teacher

Second Teacher

20. Headers for tests:

```
\examhd{}
\examhd{Semester}
\examhd[Test]{on chapter 1}
```

Test
Test Semester
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}
```

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

25. Matching questions:

```
\setlist*[leftmatching]{label=}
\setlist*[rightmatching]{label=}
\setlength{\rightmatchwidth}{200pt}
\matchingque[320pt]{number,shape,color}{blue,green,
square,integer,circle,cube}
```

	blue
	green
number	square
shape	integer
color	circle
	cube