

# The schl package<sup>\*</sup>

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## Abstract

schl is a  $\text{\LaTeX}$  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 system, but it may be useful in other contexts as well.

## 1 Introduction

Worksheets and tests are common document types in a classroom. schl package comes with macros that facilitate the creation of these documents. It has list environments for questions, exercises and tasks. Other environments of the package can be used for tickable or multiple choice answers. There are also commands for typesetting solutions, hints and answers to exercises.

Furthermore, you can set the name of the teacher, subject, grade, headmaster, school, date, school year and use these to print school's logo or information about an exam. schl has commands to typeset headers for each document type, a macro for typing the points of an exercise and two commands for blank space. There is also a macro for typesetting a wish for good luck!

schl is based on the Greek school practice. It redefines in Greek the common math macros  $\sin$ ,  $\cos$ ,  $\tan$ ,  $\cot$  and  $\gcd$ . Also, it provides the math operator  $\text{lcm}$  for the least common multiple of integers. Another characteristic of Greek school mathematics, is that  $\lim$  operator appears in display mode. schl offers a macro for this.

By default, schl prints all macros in Greek but this can be changed to any other language. This can be done by redefining package's internal macros.

schl loads the packages fontspec, enumitem, mdframed and amsmath. It is written for  $\text{\LaTeX}$ , but can be used by any system that supports fontspec.

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<sup>\*</sup>This document corresponds to schl v0.1, dated 2019/06/15.

## 2 Macros

### 2.1 Mathematics

`\sin` These macros redefine in Greek the corresponding trigonometric operators `\sin`, `\cos`, `\tan`  
`\cos` and `\cot`.  
`\tan`  
`\cot`

```

1 \renewcommand{\sin}{\mathop{%
2   \mathgroup\symgropoperators \eta\mu}\nolimits}
3 \renewcommand{\cos}{\mathop{%
4   \mathgroup\symgropoperators \sigma\upsilon\pi\alpha\nu}\nolimits}
5 \renewcommand{\tan}{\mathop{%
6   \mathgroup\symgropoperators \varphi}\nolimits}
7 \renewcommand{\cot}{\mathop{%
8   \mathgroup\symgropoperators \sigma\phi}\nolimits}

```

`gropoperators` is the font used to typeset the functions.

`\gcd` `\gcd` and `\lcm` provide the arithmetic operators for greatest common divisor and  
`\lcm` least common multiple in Greek. `\gcd` is redefined as

```

9 \renewcommand{\gcd}{\mathop{%
10  \mathgroup\symgropoperators MK\Delta}\nolimits}

```

On the other hand, for `\lcm` we have

```

11 \DeclareMathOperator{\lcm}{ΕΚΠ}

```

`\limdisplay` Command `\limdisplay {<text>}` prints `<text>` under `\lim`

```

12 \newcommand{\limdisplay}[1]{\displaystyle\lim_{#1}}

```

### 2.2 Blank space

`\lowerdots` Usually, we need to designate blank space in a document. `schl` package has two  
`\blankspace` commands for this. The first one `\lowerdots [<length>]{<number>}`, prints `<number>`  
dotted. Optional argument `<length>` sets the deviation from base line. It's default value is  
`-0.3ex`.

```

13 \newcommand\lowerdots[2][-0.3ex]{%
14   \begingroup
15   \lccode`m=`.\relax
16   \raisebox{#1}{\lowercase\expandafter{\romannumeral\number\number#2 000}}%
17   \endgroup
18 }

```

`\blankspace [<length>]{<linelength>}` prints a line with length `<linelength>`. The  
optional argument is the deviation from the base line and it's default value is `-0.3ex`.  
`\schl@rulethickness` is the default thickness for all `\blankspace` lines.

```

19 \newcommand\blankspace[2][-0.3ex]{%
20   \raisebox{#1}{\rule{#2}{\schl@rulethickness}}
21 }

```

## 2.3 Lists

schl package defines six types of lists. These are question, exercise, schltask, multichoice, tickchoice and truefalse. tickchoice comes also with a starred version tickchoice\*. All of them depend on the package enumitem.

question These environments are enumerate-like lists. List's \item is of the form  $\langle type \rangle$   
exercise  $\langle counter \rangle$ , where type is \question@term for question, \exercise@term for exercise  
schltask and \task@term for schltask.  $\langle counter \rangle$  is the internal counter of the environment.

```

22 \newlist{question}{enumerate}{1}
23 \setlist*[question]{%
24   align=left,
25   label=\normalsize\bf \question@term\ \arabic*.,
26   wide,
27   leftmargin=0pt,
28   labelindent=0pt
29 }

30 \newlist{exercise}{enumerate}{1}
31 \setlist*[exercise]{%
32   align=left,
33   label=\normalsize\bf \exercise@term\ \arabic*.,
34   wide,
35   leftmargin=0pt,
36   labelindent=0pt
37 }

38 \newlist{schltask}{enumerate}{1}
39 \setlist*[schltask]{%
40   align=left,
41   label=\normalsize\bf\letterspace{\defaultletterspace}\task@term\ \Alph*,
42   wide,
43   leftmargin=0pt,
44   labelindent=0pt
45 }
```

\letterspace The macro \letterspace{ $\langle number \rangle$ } is used to set the horizontal space of adjacent characters in a word. It is based on the \addfontfeature macro from the package fontspec. The argument  $\langle number \rangle$  is a percentage of the font size.

```
46 \def\letterspace#1{\addfontfeature{LetterSpace=#1}}
```

multichoice The multichoice environment is used to typeset multiple choice answers.

```

47 \newlist{multichoice}{enumerate*}{1}
48 \setlist*[multichoice]{
49   labelindent=\parindent,
50   label=\Alph*.,
51   itemjoin=\hspace{\fill},
52   before=\hspace{\fill},
53   after=\hspace{\fill}
54 }
```

tickchoice The environments tickchoice and tickchoice\* are variants of the itemize list.  
tickchoice\*

For both cases, each item is preceded by a square. tickchoice stacks items vertically,

```
55 \newlist{tickchoice}{itemize}{1}
56 \setlist[tickchoice]{labelindent=\parindent,label={\large$\square$}}
```

while tickchoice\* stacks them horizontally.

```
57 \newlist{tickchoice*}{itemize*}{1}
58 \setlist*[tickchoice*]{
59   labelindent=\parindent,
60   label={\large$\square$},
61   itemjoin=\hspace{\fill},
62   before=\hspace{\fill},
63   after=\hspace{\fill}
64 }
```

truefalse truefalse is a variant of the enumerate environment. Each \item is divided in two parts. The first part is the text that follows the \item macro. The second part is a \parbox that prints \trueabbr@term and \falseabbr@term.

```
65 \newlist{truefalse}{enumerate}{1}
66 \setlist[truefalse]{label={\bf \arabic*},%
67   before*=%
68     \let\defaultitem\item%      Save the standard definition of \item in a macro.
69     \toggletrue{first}%        Set the first toggle with initial value true.
70     \def\item{%
71       \iftoggle{first}{%
72         \togglefalse{first}%    Set the first toggle to take the value false.
73         \defaultitem\begin{minipage}[t]{0.8\linewidth minus \truefalselength}%
74       }{%
75         \end{minipage}\hfill\truefalselabel\defaultitem%
76         \begin{minipage}[t]{0.8\linewidth minus \truefalselength}%
77       }
78     }% new, temporary definition of \item
79   },
80   after*=% This takes care of adding the fill for the final item on
81     %      the list and just makes sure that \item is reset to its standard definition
82     \end{minipage}\hfill\truefalselabel% fill for final item in list
83     \let\item\defaultitem% restore standard definition of \item
84   }%
85 }
```

matchingque The macro \matchingque{<CSV>}{<CSV>} is used to typeset matching questions. <CSV> are comma separated values. The <CSV>s of the first argument are the parts of the matching questions that will be print in the left column. Similarly, the <CSV> of the second argument are going to be printed on the right column of the matching questions.

```
86 \newcommand\matchingque[3][300pt]{%
87   \begin{center}
88     \parbox[c]{#1}{
89       \parbox[c]{\leftmatchwidth}{%
90         \begin{leftmatching}
91           \@for\tmp:=#2%
92           \do{%
```

```

93         \item \tmp
94     }
95     \end{leftmatching}
96 } \hfill%
97 \parbox[c]{\rightmatchwidth}{%
98     \begin{rightmatching}
99         \@for\tmp:=#3%
100         \do{%
101             \item \tmp
102         }
103     \end{rightmatching}
104 }
105 }
106 \end{center}
107 }

```

`leftmatching`      Environments `leftmatching` and `rightmatching` are used to typeset each column  
`rightmatching` in `\matchingque`.

```

108 \newlist{leftmatching}{enumerate}{1}
109 \newlist{rightmatching}{enumerate}{1}
110 \setlist*[leftmatching]{label=\bf\Alph*.}
111 \setlist*[rightmatching]{label=\bf\arabic*.}

```

## 2.4 Answers, solutions and hints

`\answer`      Macro `\answer{<text>}` prints (`\answerabbr@term` `\meta{text}`) at the right end of the current line.

```

112 \newcommand\answer[1]{%
113     \hfill{\footnotesize (\answerabbr@term: #1)}
114 }

```

`\solution`      Macro `\solution{<text>}` is used to typeset the solution of an exercise.

```

115 \newcommand\solution[1]{%
116     \par\noindent\phantom{.}\hfill\textbf{\solution@term}\hfill\phantom{.}\par%
117     \noindent #1
118 }

```

`\hint`          `schl` provides the macro `\hint{<text>}` for typesetting exercise hints.

```

119 \newcommand\hint[1]{%
120     \par{\scriptsize\noindent\textbf{\hint@term:} #1}%
121 }

```

`\deadline`      A feature of homework assignments is a deadline date. `\deadline{<date>}` prints `\deadline@term` followed by argument `<date>`.

```

122 \newcommand\deadline[1]{%
123     \noindent{\bf\normalsize\deadline@term:} #1%
124 }

```

## 2.5 Titles and headers

<code>\heading</code>	Common document types in a school environment are the worksheet, various tests and final written exams. The macro <code>\heading{&lt;text&gt;}</code> gives a generic header for all these documents.
	<pre> 125 \newcommand\heading[1]{% 126   \begin{center} 127     {\bf\large #1} 128   \end{center} 129 }</pre>
<code>\worksheettitle</code>	Macro <code>\worksheettitle{&lt;text&gt;}</code> sets the title of a worksheet. It appends <code>&lt;text&gt;</code> to <code>\worksheet@term</code> .
	<pre> 130 \newcommand\worksheettitle[1]{% 131   \heading{\worksheet@term\ #1} 132 }</pre>
<code>\examtitle</code>	<code>\examtitle[&lt;text&gt;]{&lt;text&gt;}</code> is used to set the title of tests. the optional argument has the default value <code>\termtest@term</code> .
	<pre> 133 \newcommand\examtitle[2][\termtest@term]{% 134   \heading{#1 #2} 135 }</pre>
<code>\finalexamheader</code>	Titles for end year exams have a standardized form in Greek schools. <code>\exams@term</code> is followed by information about the exam, then comes <code>\period@term</code> with the exam period after it. <code>\finalexamheader{&lt;info&gt;}{&lt;period&gt;}</code> is used for these cases.
	<pre> 136 \newcommand\finalexamheader[2]{% 137   \heading{\letterspace{\defaultletterspace} #1 \exams@term\ [0.5ex] \period@term\ #2} 138 }</pre>
<code>\schl@framedbox</code>	<code>\schl@framedbox{&lt;text&gt;}</code> prints <code>&lt;text&gt;</code> in a centered frame box. It is used by <code>\theorypart</code> and <code>\exercisepart</code> .
	<pre> 139 \newcommand\schl@framedbox[1]{% 140   \begin{center} 141     \fbox{\large{\bf\letterspace{\defaultletterspace} #1} }% 142   \end{center} 143 }</pre>
<code>\theorypart</code> <code>\exercisepart</code>	Sometimes theory and exercise sections constitute a written test. Macros <code>\theorypart</code> and <code>\exercisepart</code> print headers for those parts.
	<pre> 144 \newcommand\theorypart{% 145   \schl@framedbox{\theoryheader@term\!} 146 }  and  147 \newcommand\exercisepart{% 148   \schl@framedbox{\exercisepart@term\!} 149 }</pre>

## 2.6 School information

`\school`      The macros `\school{<text>}`, `\headmaster{<name>}`, `\teacher{<name>}`, `\subject{<text>}`,  
`\headmaster`    `\grade{<text>}`, `\schoolyear{<year>}` and `\schldate{<date>}` define and set the  
`\teacher`      value of internal macros.  
`\subject`      150 `\newcommand\school[1]{\def\schl@school{#1}}`  
`\grade`        151 `\newcommand\headmaster[1]{\def\schl@headmaster{#1}}`  
`\schoolyear`    152 `\newcommand\teacher[1]{\def\schl@teacher{#1}}`  
`\schldate`      153 `\newcommand\subject[1]{\def\schl@subject{#1}}`  
                  154 `\newcommand\grade[1]{\def\schl@grade{#1}}`  
                  155 `\newcommand\schoolyear[1]{\def\schl@schoolyear{#1}}`  
                  156 `\newcommand\schldate[1]{\def\schl@schldate{#1}}`

`\authorityi`      In a similar vein, `\authorityi{<text>}`, `\authorityii{<text>}` and `\authorityiii{<text>}`  
`\authorityii`    define the internal macros `\schl@authorityi`, `\schl@authorityii` and `\schl@authorityiii`.  
`\authorityiii`    157 `\newcommand\authorityi[1]{\def\schl@authorityi{#1}}`  
                  158 `\newcommand\authorityii[1]{\def\schl@authorityii{#1}}`  
                  159 `\newcommand\authorityiii[1]{\def\schl@authorityiii{#1}}`

## 2.7 Other macros for tests

`\points`      `\points{<number>}` is used to designate the points of an exercise. `{<number>}` is  
                  the number of points for the current exercise.  
                  160 `\newcommand\points[1]{%`  
                  161 `\phantom{.}\hfill(\textbf{\footnotesize \points@term{#1}\ #1})`  
                  162 `}`

`\fullname`      `\fullname{<text>}` prints `\fullname@term` followed by `<text>`.  
                  163 `\newcommand\fullname[1]{%`  
                  164 `\noindent{\normalsize\fullname@term :} #1`  
                  165 `}`

`\datefield`      Similarly, `\datefield{<text>}` prints `\date@term` with `<text>` after it.  
                  166 `\newcommand\datefield[1][0]{%`  
                  167 `\noindent{\normalsize\date@term :}`  
                  168 `}`

`\schoollogo`      `\schoollogo{<width>}` prints `\schl@school`, `\schl@grade`, `\schl@subject`  
                  and `\schl@teacher`. `<width>` is the length of the `\parbox`.  
                  169 `\def\schoollogo#1{%`  
                  170 `\parbox[t]{#1}{%`  
                  171 `\schl@school\\%`  
                  172 `\schl@grade\\%`  
                  173 `\schl@subject\\%`  
                  174 `\schl@teacher`  
                  175 `}`  
                  176 `}`

`\authoritylogo`    `\authoritylogo{<path>}` prints `\sch@authorityi`, `\sch@authorityii`, `\sch@authorityiii`  
                  and `\schl@school`. Argument `<path>` is a path to a picture.

```

177 \newcommand\authoritylogo[1]{%
178   \noindent\parbox[t]{40ex}{%
179     \centering%
180     \includegraphics{#1}
181
182     \vspace{\lineskip}
183
184     {\bf\letterspace{\defaultletterspace}\schl@authorityi}
185
186     \vspace{3\lineskip}
187
188     {\footnotesize\letterspace{\defaultletterspace}\schl@authorityiii}
189
190     \vspace{2\lineskip}
191
192     {\footnotesize\letterspace{\defaultletterspace}\schl@authorityiii}
193
194     \vspace{3\lineskip}
195
196     {\small\letterspace{\defaultletterspace}\MakeUppercase{\schl@school}}
197   }
198 }

\examdetails Written exam documents contain information about the period of the exam, subject,
\examdetailsii grade, writer of the test, supervisors of the exam and date. schl package has the macros
\examdetails{<text>} and \examdetailsii for printing this information. Argument
<text> of \examdetails is the exam period.

199 \newcommand\examdetails[2][3pt]{%
200   \parbox[t]{20em}{
201     \begin{mdframed}[linewidth=#1]
202       \normalsize%
203       {%
204         \bf\letterspace{\defaultletterspace}%
205         \schoolyearabbr@term:\hspace{3pt}\schl@schoolyear
206       }\\[1.0ex]
207       \textbf{\grade@term:}\hspace{3pt}\schl@grade\\[1.0ex]
208       \textbf{\subject@term:}\hspace{3pt}\schl@subject \\[1.0ex]
209       \textbf{\testwriter@term:}\hspace{3pt}\schl@teacher\\[1.0ex]
210       \textbf{\testsupervisor@term:}\\[1.0ex]
211       \textbf{\date@term:}\hspace{3pt}\schl@schldate
212     \end{mdframed}
213   }
214 }

and

215 \newcommand\examdetailsii{%
216   \parbox[t]{330pt}{%
217     \begin{center}%
218       \underline{\bf\letterspace{\defaultletterspace}\schoolyear@term\ \schl@schoolyear}%
219     \end{center}

```



```

220 \begin{tabular}{|c|p{60pt}|p{40pt}|p{60pt}|}
221 \hline
222 {\bf\letterspace{\defaultletterspace}\lastname@term:} & \multicolumn{3}{|c|}{ } \\
223 \hline
224 {\bf\letterspace{\defaultletterspace}\name@term:} & \multicolumn{3}{|c|}{ } \\
225 \hline
226 {\bf\letterspace{\defaultletterspace}\examnoabbr@term:} & %
227 & {\bf\letterspace{\defaultletterspace}\MakeUppercase{\grade@term:}} & \\
228 & & \schl@grade & \\
229 \hline
230 {\bf\letterspace{\defaultletterspace}\MakeUppercase{\subject@term:}} & %
231 & \multicolumn{3}{|c|}{\schl@subject} & \\
232 \hline
233 {\bf\letterspace{\defaultletterspace}\MakeUppercase{\date@term:}} & \schl@schldate
234 & {\bf\letterspace{\defaultletterspace}\time@term:} & %
235 & \schl@examtime & \\
236 \hline
237 \end{tabular}
238 }
239 }

```

**\signatures** Some types of written tests end with the names of the headmaster and the teacher(s) followed by handwritten signatures. Macro `\signer{<name>}` accepts the name of a signer. `\signatures[<role>]{<signer(s)>}` prints the name(s) of the `<signer(s)>` under a line with the `<role>` of the signer(s). `\signatureslength` is the length of the `\signatures` block.

```

240 \newcommand\signer[1]{\par #1}
241 \newcommand\signatures[2][\headmaster@term]{%
242 \parbox[t]{\signatureslength}{%
243 \setlength \baselineskip{\signaturelineskip}
244 \begin{center}
245 #1 \\ #2
246 \end{center}
247 }
248 }

```

**\wish** `\wish` prints `\schl@wish`, a default wish for tests.

```

249 \newcommand\wish[1][\schl@wish]{%
250 \begin{center}
251 {\LARGE\bf #1}
252 \end{center}
253 }

```