

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

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July, 2019

## 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 1 \renewcommand{\sin}{\mathop{%
\cot 2 \mathgroup\symgropoperators \eta\mu}\nolimits}
3 \renewcommand{\cos}{\mathop{%
4 \mathgroup\symgropoperators \sigma\upsilon\lambda\nu}\nolimits}
5 \renewcommand{\tan}{\mathop{%
6 \mathgroup\symgropoperators \varsigma\phi}\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 \text{MK}\Delta}\nolimits}
```

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

```
11 \DeclareMathOperator{\lcm}{\text{EK}\Pi}
```

`\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>`  
dots. 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 five types of lists. These are question, exercise, schltask, multichoice and tickchoice. The last one 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\letterspace\bf \task@term\, \Alph*,
42   wide,
43   leftmargin=0pt,
44   labelindent=0pt
45 }
```

\letterspace The macro \letterspace is used to set the horizontal space of adjacent characters in a word. It is based on the \addfontfeature macro from the package fontspec.

```
46 \def\letterspace{\addfontfeature{LetterSpace=10.0}}
```

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 }

```

## 2.4 Answers, solutions and hints

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

```

65 \newcommand\answer[1]{%
66   \hfill\footnotesize (\answerabbr@term: #1)
67 }

```

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

```

68 \newcommand\solution[1]{%
69   \par\noindent\phantom{.}\hfill\textbf{\solution@term}\hfill\phantom{.}\par%
70   \noindent #1
71 }

```

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

```

72 \newcommand\hint[1]{%
73   \par\scriptsize\noindent\textbf{\hint@term:} #1%
74 }

```

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

```

75 \newcommand\deadline[1]{%
76   \noindent{\normalsize\bf \deadline@term: #1}
77 }

```

## 2.5 Titles and headers

`\heading` Common document types in a school environment are the worksheet, various tests and final written exams. The macro `\heading{<text>}` gives a generic header for all these documents.

```

78 \newcommand\heading[1]{%
79   \begin{center}
80     {\bf\large #1}
81   \end{center}
82 }

```

`\worksheettitle` Macro `\worksheettitle{<text>}` sets the title of a worksheet. It appends `<text>` to `\worksheet@term`.

```

83 \newcommand\worksheettitle[1]{%
84   \heading{\worksheet@term\, #1}
85 }

```

`\examtitle` `\examtitle[<text>]{<text>}` is used to set the title of tests. the optional argument has the default value `\termtest@term`.

```

86 \newcommand\examtitle[2][\termtest@term]{%
87   \heading{#1 #2}
88 }

```

`\finalexamheader` Titles for end year exams have a standardized form in Greek schools. `\exams@term` is followed by information about the exam, then comes `\period@term` with the exam period after it. `\finalexamheader{<info>}{<period>}` is used for these cases.

```

89 \newcommand\finalexamheader[2]{%
90   \heading{\letterspace #1 \exams@term\ [0.5ex] \period@term\, #2}
91 }

```

`\schl@framedbox` `\schl@framedbox{<text>}` prints `<text>` in a centered frame box. It is used by `\theorypart` and `\exercisepart`.

```

92 \newcommand\schl@framedbox[1]{%
93   \begin{center}
94     \fbox{\large{\bf\letterspace #1} }%
95   \end{center}
96 }

```

`\theorypart` Sometimes theory and exercise sections constitute a written test. Macros `\theorypart` and `\exercisepart` print headers for those parts.

```

97 \newcommand\theorypart{%
98   \schl@framedbox{\theoryheader@term\!}
99 }

```

and

```

100 \newcommand\exercisepart{%
101   \schl@framedbox{\exercisepart@term\!}
102 }

```

## 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 value of internal macros.

```

\teacher
\subject 103 \newcommand\school[1]{\def\schl@school{#1}}
\grade   104 \newcommand\headmaster[1]{\def\schl@headmaster{#1}}
\schoolyear 105 \newcommand\teacher[1]{\def\schl@teacher{#1}}
\schldate  106 \newcommand\subject[1]{\def\schl@subject{#1}}
           107 \newcommand\grade[1]{\def\schl@grade{#1}}
           108 \newcommand\schoolyear[1]{\def\schl@schoolyear{#1}}
           109 \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`

```

110 \newcommand\authorityi[1]{\def\schl@authorityi{#1}}
111 \newcommand\authorityii[1]{\def\schl@authorityii{#1}}
112 \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.

```

113 \newcommand\points[1]{%
114 \phantom{.}\hfill(\textbf{\footnotesize \points@term{#1}\, #1})
115 }

```

`\textfield` `\textfield{<text>}{<number>}` prints `<text>` followed by `<number>` dots.

```

116 \newcommand\textfield[2]{%
117 \noindent{\normalsize\bf #2:} \lowerdots{#1}
118 }

```

`\fullname` Macro `\textfield` is used by `\fullname{<number>}`. It prints `\fullname@term` with `<number>` dots after it.

```

119 \newcommand\fullname[1][60]{%
120 \textfield{#1}{\fullname@term}
121 }

```

`\datefield` Similarly, `\datefield{<number>}` prints `\date@term` followed by `<number>` dots.

```

122 \newcommand\datefield[1][30]{%
123 \textfield{#1}{\date@term}
124 }

```

`\schoollogo` `\schoollogo` prints `\schl@school`, `\schl@grade`, `\schl@subject` and `\schl@teacher`.

```

125 \def\schoollogo{%
126 \noindent\parbox[t]{25ex}{%
127 \bf%
128 {\letterspace%
129 \schl@school\\%
130 \schl@grade}\\%
131 \schl@subject\\%
132 \schl@teacher
133 }
134 }

```

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

```

135 \newcommand\authoritylogo[1]{%
136 \noindent\parbox[t]{40ex}{%
137 \centering%
138
139 \vspace{1ex}
140

```

```

141 \includegraphics{#1}
142
143 \vspace{\lineskip}
144
145 {\bf\letterspace\schl@authorityi}
146
147 \vspace{8\lineskip}
148
149 {\scriptsize\letterspace\schl@authorityii}
150
151 \vspace{2\lineskip}
152
153 {\footnotesize\letterspace\schl@authorityiii}
154
155 \vspace{8\lineskip}
156
157 {\small\letterspace\schl@school}
158 }
159 }

\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.

160 \newcommand\examdetails[2][3pt]{%
161 \parbox[t]{20em}{
162 \begin{mdframed}[linewidth=#1]
163 \normalsize%
164 {%
165 \bf\letterspace%
166 \schoolyearabbr@term:\hspace{3pt}\schl@schoolyear\\[1ex]
167 \examperiod@term #2}\\[1.0ex]
168 \textbf{\grade@term:}\hspace{3pt}\schl@grade\\[1.0ex]
169 \textbf{\subject@term:}\hspace{3pt}\schl@subject \\[1.0ex]
170 \textbf{\testwriter@term:}\hspace{3pt}\schl@teacher\\[1.0ex]
171 \textbf{\testsupervisor@term:}\\[1.0ex]
172 \textbf{\date@term:}\hspace{3pt}\schl@schldate
173 \end{mdframed}
174 }
175 }

and

176 \newcommand\examdetailsii{%
177 \parbox[t]{330pt}{%
178 \begin{center}\underline{\bf\letterspace\schoolyear@term\, \schl@schoolyear}\end{center}
179 \begin{tabular}{|c|p{60pt}|p{40pt}|p{60pt}|}
180 \hline
181 {\bf\letterspace\lastname@term:} & \multicolumn{3}{|c|}{} \\
182 \hline
183 {\bf\letterspace\name@term:} & \multicolumn{3}{|c|}{} \\

```

```

184     \hline
185     {\bf\letterspace\examnoabbr@term:} & & {\bf\letterspace\MakeUppercase{\grade@term:}}
186                                         & \schl@grade \\
187     \hline
188     {\bf\letterspace\MakeUppercase{\subject@term:}} & \multicolumn{3}{|c|}{\schl@subject} \\
189     \hline
190     {\bf\letterspace\MakeUppercase{\date@term:}} & \schl@schldate
191                                         & {\bf\letterspace\time@term:} & \schl@examtime\\
192     \hline
193 \end{tabular}
194 }
195 }

\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.
196 \newcommand\signer[1]{\par #1}
197 \newcommand\signatures[2][\headmaster@term]{%
198   \parbox[t]{\signatureslength}{%
199     \setlength \baselineskip{\signaturelineskip}
200     \begin{center}
201       #1 #2
202     \end{center}
203   }
204 }

\wish            \wish prints \schl@wish, a default wish for tests.
205 \newcommand\wish{%
206   \begin{center}
207     {\LARGE\bf \schl@wish}
208   \end{center}
209 }

```