TMA: LaTeX101-notes

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Update for 2024/11/08 v1.12

Notes

This document describes Peter McFarlane's `tma` package. To use it, the `tma.sty` file should be in the same directory/folder as your main `.tex` source file or in the file path for your compiler. Using MiKTeX* v24.1 on Windows, installed for all users, this would be:
`C:\Program Files\MiKTex\tex\latex\tma`
(you need to create the `tma` folder).

Once you have added `tma.sty` to the directory, it is necessary to let MiKTeX know that it is there. So load MiKTeX, go to MiKTeX Settings and press the 'Refresh FNDB' (**F**ile **N**ame **D**ata**B**ase) button that tells LaTeX to remake the database of all the files, then it will find `tma.sty`. See:
http://docs.miktex.org/manual/configuring.html#fndbupdate.

Other TeX installations will have similar centralised file storage settings for style files.

The contents of the file in which you write a TMA should look like this:

```
\documentclass[a4paper,12pt]{article}
\usepackage{tma}
%% or include options [roman] or [alph]:
% \usepackage[roman]{tma} % For Roman numerals in subparts
% \usepackage[alph]{tma}  % For the default alphabetical letters in subparts

\myname{Nosmo King}
\mypin{A1234567}
```

*The latest version of MiKTeX is always downloadable from https://miktex.org/.

```
\mycourse{L101}
\mytma{01}

\begin{document}

 \include{question_01}
 \include{question_02}

\end{document}
```

Using `\include` and writing your questions in separate files is unnecessary. But do start each question with `\begin{question}` and end it with `\end{question}`, whether or not you use separate files for each question, or write all the questions in the main text.

If you wish to have margin notes, then include `\marginnotes` in your preamble, whereupon `\marginnote{}` is equivalent to `\marginpar{}` and places the context of the brackets in the margin.

The question numbers and question parts appear in the margin.

The normal sequence for numbering of questions is Arabic numerals for the main question numbers, letters for the parts, and Roman numerals for the subparts. If you are on a module that uses Roman numerals for the part, such as M381, then you can pass the option `[roman]` to the `\usepackage` command to vary the numbering system. See below for further details of options.

If you want to skip a question (i.e. jump straight from question 1 to question 3, then use (for example) `\begin{question}[3]`. To get parts of questions (a), (b), (c) etc, use `\qpart`. To skip part question numbers `\qpart[3]` would force a (c). For subparts (i), (ii), (iii), etc, then use `\qsubpart`.

There is a slight gap between paragraphs and no indent, although, as mentioned, the question numbers are in the left-hand margin.

Options

When requesting the `tma` package with the `\usepackage` command, it is possible to pass one or more optional parameters to influence how the package will operate. Just as it is typical to let the `\documentclass` have options specifying the paper and font size, so can many other packages being given options.

To use a package option, place the option(s) before the package name in square brackets, for example:
`\usepackage[roman,cleveref]{tma}`

Option	Effect
`[alph]`	(default) question numbering as 1(b)(iii)
`[roman]`	varies question numbering to sequence used by M381 i.e. 1(ii)(c)
`[cleveref]`	question numbering creates automatic referencing for use with `cleveref` package
`[pdfbookmark]`	add pdf bookmarks for each question using `hyperref` package
`[legacy]`	add backward compatibility for old versions of `tma` package

Table 1: Options available for `tma.sty`

New commands

New commands provided by the package include the following:

`\R` $\mathbb{R}$ `\N` $\mathbb{N}$ `\Z` $\mathbb{Z}$ `\Q` $\mathbb{Q}$ `\Complex` $\mathbb{C}$

In typeset mathematics, constants such as e, i ($\sqrt{-1}$), and π should be not be italic, nor should d (as in $\frac{\mathrm{d}y}{\mathrm{d}x}$ or $\int \mathrm{e}^x \, \mathrm{d}x$). Hence:

`\dd` d `\e` e `\ii` i `\uppi` π

(`\d` produces a dot over the following character. `\i` produces a dotless i to enable accents over a naïve ı. `\uppi` is provided by the upgreek package (and can be used for all Greek letters). `\dd` also adds a small space before the dx so that it is slightly separated from the integral equation instead of being part of it.

`\deriv{y}{x}` $\frac{\mathrm{d}y}{\mathrm{d}x}$ `\pderiv{y}{x}` $\frac{\partial y}{\partial x}$

`\psderiv{z}{x}{y}` $\frac{\partial^2 z}{\partial y \partial x}$

Other commands, some of which have been plagiarised from other peoples' style files, include mathematical functions for the principle logarithm and various group theory and complex analysis functions. Also, a `\rect` is included for M208 people (other shapes are included by virtue of the `wasysym` package). Commands available are given in table 2; the upper set of commands will work in text or maths mode, whilst the lower commands are only designed to work in maths mode.

Backward compatibility

As of version 1.04 of the `tma` package, two commands have been renamed to avoid clashes with other libraries. `\C` has been renamed `\Complex`, and `\vec` has been renamed `\vect`. In order to allow order documents to still use the new version of the package, an additional option has been provided, `[legacy]`, and this will reimplement the old names. These old names, however, are now deprecated and may be removed in future issues.

Command	Example	Note
`\Rr`	$\mathcal{R}$	(for a region)
`\ve{j}`	$\mathbf{j}$	for emboldened vectors
`\vect{AB}`	$\overrightarrow{AB}$	for traditional vectors
`1\st`	1^{st}	also `\nd`, `\rd`, `\nth`
`\rect`	$\square$	
`\comb{3}{5}`	${}^5C_3$	
`\perm{3}{5}`	${}^5P_0$	
`\re`	Re	`\Re` will produce the traditional $\Re$
`\im`	Im	`\Im` will produce $\Im$
`\Log`	Log	
`\Arg`	Arg	
`\Wnd`	Wnd	
`\Res`	Res	
`\Ker`	Ker	
`\Res`	Res	
`\Orb`	Orb	
`\Stab`	Stab	
`\Fix`	Fix	

Table 2: Mathematical commands that are made available with `tma.sty`

Packages automatically loaded

Some standard packages are automatically loaded when the `tma` package is used. These, in turn, load other packages. A summary of the packages so loaded is listed in table 3.

Note that the latter two packages are conditionally loaded only when the appropriate option is specified.

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Any comments, ideas, or suggestions (either of style or for more macros) are welcomed.

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Package	Notes
`amssymb`	Also loads `amsfonts`
`amsmath`	Also loads `amstext`, `amsgen`, `amsbsy` and `amsopn`
`amsthm`	
`upgreek`	
`wasysym`	
`bm`	This allows you to embolden maths formulae: `$\int \e^x \dd x=\bm{\int \e^x \dd x}$` $\int \mathrm{e}^x \,\mathrm{d}x = \int \mathbf{e}^{\boldsymbol{x}} \,\mathbf{d}\boldsymbol{x}$
`fancyhdr`	
`geometry`	Also loads `keyval`, `ifvtex` and `iftex`
`xifthen`	Also loads `calc`, `ifthen` and `ifmtarg`
`verbatim`	
`graphicx`	Also loads `graphics` and `trig`
`lastpage`	Also loads `lastpage2e` and `lastpagemodern`
`cleveref`	This is only loaded if the `cleveref` option is given to the style.
`hyperref`	This is only loaded if the `cleveref` or `pdfbookmark` option is given to the style.

Table 3: Packages auto-loaded by `tma.sty`