

keytheorems package

version 0.1.0

github.com/mbertucci47/keytheorems

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Abstract

An expl3-implementation of a key-value interface to `amsthm`, implementing most of the functionality provided by `thmtools`. Several issues encountered with `thmtools` are avoided and a few new features are added (see the README).

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1 Dependencies

Without using the `tcolorbox`^{P.6} or `tcolorbox-no-titlebar`^{P.7} options, the package loads the `aliascnt`, `amsthm`, `refcount`, and `translations` packages.

2 Global Options

`\keytheoremset{<options>}`

Every key in this section can be given as a package option with `\usepackage[<options>]{keytheorems}` or in `\keytheoremset{<options>}`, with the exception that `continues-code`^{→P.2} can only be used in the latter.

`overload` (initially unset)

Redefines `\newtheorem` to internally use the `keytheorems` machinery. The syntax remains the same.

`thmtools-compat` (initially unset)

For compatibility with `thmtools` syntax. Currently defines the following commands:

thmtools command	keytheorems replacement
<code>\declaretheorem</code>	<code>\newkeytheorem</code>
<code>\declaretheoremstyle</code>	<code>\newkeytheoremstyle</code> ^{→P.7}
<code>\listoftheorems</code>	<code>\listofkeytheorems</code> ^{→P.9}
<code>\addtotheoremheadhook</code>	
<code>\addtotheoremheadhook</code>	
<code>\addtotheoremheadhook</code>	<code>\addtotheoremhook</code> ^{→P.11}
<code>\addtotheoremheadhook</code>	
<code>\addtotheoremheadhook</code>	
<code>restatable</code> environment	<code>store</code> ^{→P.3} key

Also defined are the `shaded` and `thmbox` keys, implemented internally with `tcolorbox` rather than the `shadethm` and `thmbox` packages, respectively.

`store-all` (initially unset)

Tells `keytheorems` to grab the body of each theorem so it can later be printed with the `print-body`^{→P.10} option of `\listofkeytheorems`^{→P.9}. Note that this means a theorem body *cannot* contain verbatim material.

`restate-counters={<comma-list of counters>}` (initially `{equation}`)

Additional counters whose values are preserved when a theorem is restated. This key does not reset the list, so you don't need to include `equation` in `<comma-list>`.

`continues-code=<code with #1>` (initially `\GetTranslation{keythms_continues}\pageref{#1}`)

The code used to typeset the note produced by the `continues`^{→P.3} key. If English or an unknown language is used, defaults to `continuing from p.\, \pageref{#1}`. Currently (likely inaccurate!) translations exist for French, German, and Spanish.

`qed-symbol=<symbol>` (initially `\openbox`)

Redefines `\qedsymbol` to be `<symbol>`.

`auto-translate=true|false` (default `true`, initially `true`)

If `false`, `keytheorems` does not automatically translate the title text for `\listofkeytheorems`^{→P.9} and the note produced by the `continues`^{→P.3} key. These texts can be manually customized with the `title`^{→P.10} and `continues-code` keys, respectively.

3 Defining Theorems

`\newkeytheorem{<env name>}[<options>]`

Defines a theorem environment `<env name>` which itself takes a few options (see subsection 3.1). You can also declare multiple theorems at once by replacing `<env name>` with a comma-list of names, e.g. `\newkeytheorem{theorem, lemma, proposition}[<options>]`.

By default, the theorem's printed name is a title-cased `<env name>`. This can be changed with the `name`^{→P.4} key. All `<options>` are described in subsections 3.2 and 3.3.

```
% preamble
\newkeytheorem{theorem}

% document
\begin{theorem}
Some text
\end{theorem}
```

Theorem 1. *Some text*

3.1 Keys available to theorem environments

As in `amsthm`, theorems can take an optional argument that contains a note or heading.

```
\begin{theorem}[some heading]
Some text
\end{theorem}
```

Theorem 2 (some heading). *Some text*

Alternatively, the optional argument may contain any of the following keys.

`note=<text>` (initially unset)

Alias `name`. This is the key-value equivalent of the optional argument described above. This syntax, however, allows the argument to contain other keys.

```
\begin{theorem}[some heading]
Some text
\end{theorem}
\begin{theorem}[note=another heading]
Some more text
\end{theorem}
```

Theorem 3 (some heading). *Some text*

Theorem 4 (another heading). *Some more text*

`short-note=<text>` (initially unset)

Alias `short-name`. This replaces the value of `note` when displayed in `\listofkeytheorems`^{P.9}.

`label=<label name>` (initially unset)

This is the key-value equivalent of `\begin{theorem} \label{<label name>}`.

```
\begin{theorem}[label=foo]
Some text
\end{theorem}
\ref{foo}
```

Theorem 5. *Some text*

5

`continues*=<label name>` (initially unset)

Pick up a theorem where you left off. The theorem number remains the same. The printed text can be customized with the `continues-code`^{P.2} option. The starred version also copies the theorem note, if it exists.

```
\begin{theorem}[continues=foo]
\dots and some more text.
\end{theorem}
```

Theorem 5 (continuing from p. 3). ... *and some more text.*

`store=<tag>` (initially unset)

Alias `restate`. Stores the the theorem to be restated at any point in the document with `\getkeytheorem`^{P.8}.

```
\begin{theorem}[store=blub]
A theorem worth restating.
\end{theorem}
More brilliant mathematics.
\getkeytheorem{blub}
```

Theorem 6. *A theorem worth restating.*

More brilliant mathematics.

Theorem 6. *A theorem worth restating.*

A theorem given this key *cannot* contain verbatim material or other unexpected catcodes, such as a `tikz-cd` diagram. The latter issue can be averted with the `ampersand-replacement` key.

```

% preamble
\usepackage{tikz}
\usetikzlibrary{cd}

% document
\begin{lemma}[store=diagram]
Some commutative diagram:
\[\begin{tikzcd}[ampersand
\rightarrow replacement=\&
X\times_S Y \ar[r] \ar[d] \& X \ar[d]
\rightarrow \& \\
Y \ar[r] \& S
\end{tikzcd}\]
\end{lemma}
\dots
\getkeytheorem{diagram}

```

Lemma 7. *Some commutative diagram:*

$$\begin{array}{ccc}
 X \times_S Y & \longrightarrow & X \\
 \downarrow & & \downarrow \\
 Y & \longrightarrow & S
 \end{array}$$

...

Lemma 7. *Some commutative diagram:*

$$\begin{array}{ccc}
 X \times_S Y & \longrightarrow & X \\
 \downarrow & & \downarrow \\
 Y & \longrightarrow & S
 \end{array}$$

`listhack=true|false`

(initially false)

Meant only to be used with the `break`^{P.8} style key for a theorem starting with a list. Compare:

```

% preamble
\newkeytheoremstyle{breaksty}{break}
\newkeytheorem{observation}[style=breaksty]

% document
\begin{observation}
\begin{enumerate}
\item First item
\end{enumerate}
\end{observation}

\begin{observation}[listhack=true]
\begin{enumerate}
\item First item
\end{enumerate}
\end{observation}

```

Observation 1. *1. First item*

Observation 2.

1. First item

Note that the value `true` must be explicitly set so that `listhack` is not interpreted as the note text.

`seq=<name>`

(initially unset)

Adds the theorem to a custom sequence `<name>` that can then be listed with `\listofkeytheorems[seq=<name>]`. See `seq`^{P.10} for more details.

3.2 Keys inherited from thmtools

These are the `[<options>]` available to `\newkeytheorem`. Except for `name` and `style`^{P.5}, each key below can also be used in `\newkeytheoremstyle`^{P.7}. For more description, see the `thmtools` package.

`name=<display name>`

(initially title-cased `<env name>`)

Aliases `title` and `heading`.

```

% preamble
\newkeytheorem{mythm}[name=Some Name]

% document
\begin{mythm}
Some text
\end{mythm}

```

Some Name 1. *Some text*

`numbered=true|false|unless-unique` (default `true`, initially `true`)

For compatibility with `thmtools`, also accepts the values `yes`, `no`, and `unless unique`.

```
% preamble
\newkeytheorem{theorem}[
  name=Theorem, numbered=false
]

% document
\begin{theorem*}
An unnumbered theorem.
\end{theorem*}
```

Theorem. *An unnumbered theorem.*

`parent=<counter>` (initially unset)

Aliases `numberwithin` and `within`.

```
% preamble
\newkeytheorem{conjecture}[parent=section]

% document
\begin{conjecture}
The first number is the section.
\end{conjecture}
```

Conjecture 3.1. *The first number is the section.*

`sibling=<counter>` (initially unset)

Aliases `numberlike` and `sharenumber`.

```
% preamble
\newkeytheorem{lemma}[sibling=theorem]

% document
\begin{lemma}
This shares its counter with
\texttt{theorem}.
\end{lemma}
```

Lemma 8. *This shares its counter with theorem.*

`style=<style name>` (initially unset)

Accepts any `<style name>` defined by `\newkeytheoremstyle`^{P.7}, as well as any of the predefined `amsthm` styles: `plain`, `definition`, and `remark`.

```
% preamble
\newkeytheorem{remark}[style=remark]

% document
\begin{remark}
Some text
\end{remark}
```

Remark 1. Some text

`preheadhook=<code>` (initially unset)

`postheadhook=<code>` (initially unset)

`prefoothook=<code>` (initially unset)

`postfoothook=<code>` (initially unset)

Details in section 7.

```

% preamble
\newkeytheorem{test}[
  preheadhook=PREHEAD,
  postheadhook=POSTHEAD,
  prefoothook=PREFOOT,
  postfoothook=POSTFOOT
]

% document
\begin{test}
Some text
\end{test}

```

PREHEAD

Test 1. *POSTHEAD*Some text *PREFOOT*

POSTFOOT

refname= \langle ref name \rangle or $\{\langle$ singular name \rangle, \langle plural name $\rangle\}$ (initially \langle display name \rangle)

If a single string, then the name used by `hyperref`'s `\autoref` and `cleveref`'s `\cref`. If two strings separated by a comma, then the second string is the plural form used by `\cref`.

Refname= \langle ref name \rangle or $\{\langle$ singular name \rangle, \langle plural name $\rangle\}$ (initially \langle display name \rangle)

Same as **refname** but for `\Autoref` and `\Cref`. Note that `\Autoref` is defined by `keytheorems`, but requires `hyperref` to work.

```

% preamble
\newkeytheorem{prop}[
  name=Proposition,
  refname={proposition,propositions},
  Refname={Proposition,Propositions}
]

% document
\begin{prop}[label=abc]
Some text
\end{prop}
\begin{prop}[label=def]
Some more text
\end{prop}
\begin{theorem}
Consider \cref{abc,def}.
\Autoref{abc} \dots
\end{theorem}

```

Proposition 1. *Some text*

Proposition 2. *Some more text*

Theorem 9. *Consider propositions 1 and 2. Proposition 1 ...*

qed= \langle symbol \rangle (default `\openbox`, initially unset)

Adds \langle symbol \rangle to the end of the theorem body. If no value is given, the symbol \square is used.

```

% preamble
\newkeytheorem{example}[qed]
\newkeytheorem{solution}[qed=$\clubsuit$]

% document
\begin{example}
Some text
\end{example}
\begin{solution}
Some more text
\end{solution}

```

Example 1. *Some text*

\square

Solution 1. *Some more text*

\clubsuit

3.3 Keys added by `keytheorems`

tcolorbox= $\{\langle$ tcolorbox options $\rangle\}$ (initially unset)

This key specifies that the theorem be placed inside a `tcolorbox` environment with \langle options \rangle . The theorem head is typeset as a `tcolorbox` title; to avoid this see `tcolorbox-no-titlebar`^{P.7}.

```

% preamble
\tcbset{
  defstyle/.style={
    arc=0mm,
    colback=blue!5!white,
    colframe=blue!75!black
  },
}
\newkeytheorem{corollary}[tcolorbox]
\newkeytheorem{definition}[
  style=definition,
  tcolorbox={defstyle}
]

% document
\begin{corollary}
Some text
\end{corollary}
\begin{definition}
Some more text
\end{definition}

```

Corollary 1.

Some text

Definition 1.

Some more text

`tcolorbox-no-titlebar={\langle tcolorbox options \rangle}`

(initially unset)

Same usage as `tcolorbox`^{P.6} but the theorem head is typeset as usual, not as a `tcolorbox` title.

```

% preamble
\newkeytheorem{boxcor}[
  tcolorbox-no-titlebar={
    colback=red!10
  },
  name=Corollary,sibling=corollary
]

% document
\begin{boxcor}
Some text
\end{boxcor}

```

Corollary 2. *Some text*

4 Theorem Styles

`\newkeytheoremstyle{\langle name \rangle}{\langle options \rangle}`

This is `keytheorems`' version of `thmtools`' `\declaretheoremstyle[\langle options \rangle]{\langle name \rangle}`. Since it makes little sense to define a style with no keys, we've made the `\langle options \rangle` argument mandatory. Note that unlike `amsthm`'s `\newtheoremstyle`, this command will error if a style has already been defined. To overwrite an existing style, there is the analogous `\renewkeytheoremstyle`. For completeness, there is also `\declarekeytheoremstyle` and `\providekeytheoremstyle`.



For the AMS classes `amsart`, `amsbook`, and `amsproc`, as well as the `amsart`-based `acmart`, the initial key values are slightly different than what's below in order to match those class's defaults.

4.1 Keys inherited from `thmtools`

The following keys have the same meaning and syntax as the corresponding `thmtools` keys. In addition to the list below, most of the keys available to `\newkeytheorem`^{P.2} can be used in `\newkeytheoremstyle`.

`spaceabove=\langle length \rangle` (initially `\topsep`)

`spacebelow=\langle length \rangle` (initially `\topsep`)

`bodyfont`= $\langle font\ declarations \rangle$ (initially `\itshape`)

`headindent`= $\langle length \rangle$ (initially 0pt)

`headfont`= $\langle font\ declarations \rangle$ (initially `\bfseries`)

`headpunct`= $\langle code \rangle$ (initially `\{.\}`)

`postheadspace`= $\langle length \rangle$ (initially 5pt plus 1pt minus 1pt)
Do not use this with the `break` key.

`break` (initially unset)
Do not use this with the `postheadspace` key.

`notefont`= $\langle font\ declarations \rangle$ (initially `\fontseries\mddefault\upshape`)

`notebraces`= $\{\langle left\ brace \rangle\}\{\langle right\ brace \rangle\}$ (initially `\{()\}`)

`headstyle`=`margin`|`swapnumber`| $\langle code\ using\ \backslash NAME, \backslash NUMBER, and \backslash NOTE \rangle$
Alias `headstyle`. Within $\langle code \rangle$, the commands `\NAME`, `\NUMBER`, and `\NOTE` correspond to the formatted parts of the theorem head.

4.2 Keys added by keytheorems

`inherit-style`= $\langle style\ name \rangle$ (initially unset)
Inherit the keys of any style declared with `\newkeytheoremstyle`^{P.7}. Additionally, the three styles predefined by `amsthm` are possible values: `plain`, `definition`, and `remark`.

5 Restating Theorems

When a theorem is given the `store`^{P.3} key, the contents of the theorem are saved and written to a `.thlist` file. At the start of the next run, this file is input at the beginning of the document and allows you to retrieve the stored theorems at any point, before or after the original theorem.

`\getkeytheorem`[$\langle property \rangle$]{ $\langle tag \rangle$ }

Retrieves the theorem given the key `store`= $\langle tag \rangle$. An optional $\langle property \rangle$ can be given to retrieve only the corresponding part of the theorem. Currently only the property `body` is implemented, which retrieves the (unformatted) body of the theorem.

```
\getkeytheorem{mytag}
```

```
\begin{example}[store=mytag]
```

```
Fascinating example.
```

```
\end{example}
```

```
\getkeytheorem[body]{mytag}
```

Example 2. *Fascinating example.* ☐

Example 2. *Fascinating example.* ☐

Fascinating example.

`\IfRestatingTF`{ $\langle true\ code \rangle$ }{ $\langle false\ code \rangle$ }

Executes $\langle true\ code \rangle$ if being retrieved with `\getkeytheorem` and $\langle false\ code \rangle$ if in the original theorem.

```
\begin{example}[store=hmm]
```

```
I am the
```

```
\IfRestatingTF{restated}{original}
```

```
example!
```

```
\end{example}
```

```
\getkeytheorem{hmm}
```

Example 3. *I am the original example!* ☐

Example 3. *I am the restated example!* ☐

6 Listing Theorems

`\listofkeytheorems[<options>]`

`\keytheoremset{<options>}`

	List of Theorems
<code>\listofkeytheorems</code>	1 Theorem 2
	2 Theorem (some heading) 2
	3 Theorem (some heading) 3
	4 Theorem (another heading) . . 3
	5 Theorem 3
	5 Theorem (continuing from p. 3) 3
	6 Theorem 3
	7 Lemma 3
	1 Observation 4
	2 Observation 4
	1 Some Name 4
	Theorem 4
	3.1 Conjecture 5
	8 Lemma 5
	1 Remark 5
	1 Test 5
	1 Proposition 6
	2 Proposition 6
	9 Theorem 6
	1 Example 6
	1 Solution 6
	1 Corollary 6
	1 Definition 6
	2 Corollary 7
	2 Example 8
	3 Example 8

6.1 Keys inherited from thmtools

`numwidth=<length>` (initially 2.3em)

`ignore={<comma-list of env names>}` (initially unset)

`show={<comma-list of env names>}` (initially all theorems)

`onlynamed={<comma-list of env names>}` (initially unset)

`ignoreall` (initially unset)

<pre> \listofkeytheorems[ignoreall,show=theorem] \listofkeytheorems[ignoreall, show=conjecture, title=List of Conjectures] </pre>	<div> <div>List of Theorems</div> <div> 1 Theorem 2 2 Theorem (some heading) . . . 2 3 Theorem (some heading) . . . 3 4 Theorem (another heading) . 3 5 Theorem 3 5 Theorem (continuing from p. 3) 3 6 Theorem 3 9 Theorem 6 </div> </div> <div> <div>List of Conjectures</div> <div> 3.1 Conjecture 5 </div> </div>
---	--

`showall` (initially set)

`title=<text>` (initially `\GetTranslation{keythms_listof_title}`)
 Defaults to “List of Theorems” if English or an unknown language is used. Currently French, German, and Spanish have (likely inaccurate!) translations. A translation can be added with a GitHub pull request or manually with `\DeclareTranslation{<lang>}{keythms_listof_title}{<text>}`.

`swapnumber=true|false` (initially false)

6.2 Keys added by keytheorems

`onlynumbered={<comma-list of env names>}` (initially unset)

Similar to `onlynamed`^{→P.9}, but lists only those theorems which are numbered. This is useful if you’d like to exclude things like unnumbered definitions and remarks from the list of theorems.

`seq=<name>` (initially unset)

Used to list only the theorems added to the custom sequence `<name>` with the `seq`^{→P.4} theorem key. This is the only way to fully customize which theorems appear in the list of theorems.

`title-code=<code with #1>` (initially `\section*{#1}`)

If `\chapter` is defined, then initially this is instead `\chapter*{#1}`.

`no-title` (initially unset)

Suppresses the title of the list of theorems. Useful for custom ordering of the list.

<pre> \keytheoremset{ignoreall} \listofkeytheorems[show=example] \listofkeytheorems[show=solution,no-title] </pre>	<div> <div>List of Theorems</div> <div> 1 Example 6 2 Example 8 3 Example 8 1 Solution 6 </div> </div>
--	---

`note-code=<code with #1>` (initially `{ (#1) }`)

Formats the optional note in the list of theorems.

`print-body` (initially unset)

Instead of listing the theorem headings, the theorems are restated with their body text. Not very useful without the `store-all`^{→P.2} load-time option.

`no-continues=true|false` (initially false)

Suppresses the printing of theorems given the `continues`^{→P.3} key in the list of theorems.

`no-chapter-skip=true|false` (initially `false`)

By default a small vertical space is inserted between each chapter’s chunk of theorems. Setting this key to `true` removes this space.

`chapter-skip-length=<dimension>` (initially 10pt)

Controls the amount of space inserted between chunks.

6.3 Adding code to list of theorems

There are analogous commands to `\addcontentsline` and `\addtocontents` for adding entries or arbitrary code to the list of theorems.



You *must* use these commands rather than the aforementioned because the `.thlist` file is also used to define restated theorems and cannot contain unexpected code.

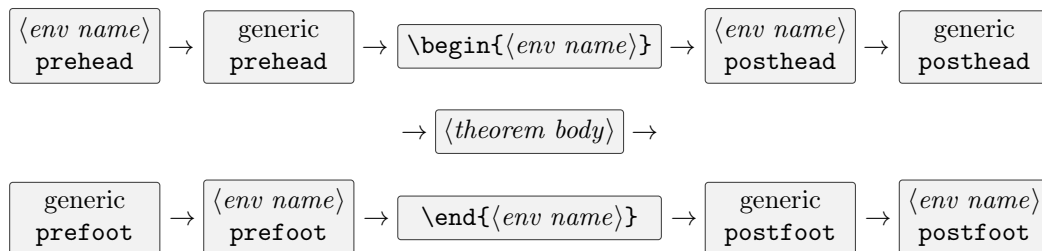
`\addtheoremcontentsline{<level>}{<text>}`

`\addtotheoremcontents{<code>}`

7 Theorem Hooks

`\addtotheoremhook[<env name>]{<hook name>}{<code>}`

`<hook name>` can be `prehead`, `posthead`, `prefoot`, `postfoot`, or `restated`. If no `<env name>` is given, the `<code>` is added to the “generic” hook, i.e. applied to all theorems. As in `thmtools`, the order of hooks is as follows:



The `restated` hook is applied at the start of theorems retrieved with `\getkeytheorem`, before the `prehead` hook. This can be useful for disabling commands such as `\footnote` in the restated theorems, e.g.

```

\addtotheoremhook{restated}{%
  \renewcommand\footnote[2][]{}%
}

```

By default, `keytheorems` disables the `\label` and `\RecordProperties` commands in restated theorems.

In `thmtools`, the `prefoot` and `postfoot` hooks always prepend code, i.e. the code

```

\addtotheoremhook{postfoot}{A}
\addtotheoremhook{postfoot}{B}

```

results in BA after the theorem. With `keytheorems`, code is added in the order declared, meaning

```

\addtotheoremhook{postfoot}{A}
\addtotheoremhook{postfoot}{B}

```

results in AB after the theorem. This is the behavior of the L^AT_EX kernel hooks that `keytheorems` uses under the hood.

Right now, code added using the hook keys `preheadhook`^{P.5}, etc. is outermost, meaning executed first in `prehead` and `posthead` and last in `prefoot` and `postfoot`. This may change if I think of good reasons to do so...

8 Implementation

```

1  \NeedsTeXFormat{LaTeX2e}[2024/06/01]
2  \ProvidesExplPackage{keytheorems}{2024-09-04}{0.1.0}{l3keys interface to amsthm}
3
4  %% TESTING
5  % \debug_on:n { all }
6  %% END TESTING
7
8  \RequirePackage{aliascnt} % for sibling theorems
9  \RequirePackage{amsthm}
10 % ~ ams classes have way of ignoring this so don't need to check if they're loaded
11 \RequirePackage{refcount} % for \getrefnumber
12 \RequirePackage{translations} % for translating "List of Theorems"
13
14 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
15 %%% Error Messages %%%
16 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
17
18 \msg_new:nnn { keytheorems } { thmtools-before }
19 {
20     keytheorems~is~not~compatible~with~thmtools.~
21     Try~replacing~\protect\usepackage{thmtools}~with~
22     \protect\usepackage[thmtools-compat]{keytheorems}.
23 }
24 \msg_new:nnn { keytheorems } { thmtools-after }
25 {
26     keytheorems~is~not~compatible~with~thmtools.~
27     This~will~not~work~as~you~think!~
28     Try~replacing~\protect\usepackage{thmtools}~with~
29     \protect\usepackage[thmtools-compat]{keytheorems}.
30 }
31 \msg_new:nnn { keytheorems } { no-stored-theorem }
32 {
33     No~stored~theorem~'#1'~found!~
34     Try~compiling~again.~If~that~doesn't~work,~
35     check~the~spelling~of~'#1'.
36 }
37 \msg_new:nnn { keytheorems } { undefined-thm-hook }
38 {
39     No~theorem~hook~'#1'.~Check~the~spelling.~
40     Should~be~one~of~'prehead',~'posthead',~'prefoot',~'postfoot',~or~'restated'.
41 }
42 \msg_new:nnn { keytheorems } { no-Autorefname }
43 {
44     No~Autorefname~for~'#1'.
45 }
46 \msg_new:nnn { keytheorems } { thmstyle-undefined }
47 {
48     Theorem~style~'#1'~undefined.~
49     Use~\protect\newkeytheoremstyle\space instead.
50 }
51 \msg_new:nnn { keytheorems } { thmstyle-defined }
52 {
53     Theorem~style~'#1'~already~defined.~
54     Use~\protect\renewkeytheoremstyle\space instead.
55 }
56

```

```

57 % Error if thmtools loaded since compilation hangs.
58 % If thmtools loaded after, produce warning.
59 \IfPackageLoadedTF { thmtools }
60 {
61   \msg_fatal:nn { keytheorems } { thmtools-before }
62 }
63 {
64   \hook_gput_code:nnn { package/thmtools/before } { . }
65   {
66     \msg_warning:nn { keytheorems } { thmtools-after }
67   }
68 }
69
70 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
71 %%% Declare Variables %%%
72 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
73
74 \tl_new:N \l__keythms_tmpa_tl
75
76 \bool_new:N \g__keythms_listof_writefile_bool
77 \bool_gset_false:N \g__keythms_listof_writefile_bool
78 \bool_new:N \l__keythms_thm_numbered_bool
79 \bool_new:N \l__keythms_thm_unlessunique_bool
80 \bool_new:N \l__keythms_thmuse_listhack_bool
81 \bool_new:N \l__keythms_thmuse_restating_bool
82 \clist_new:N \g__keythms_restatecounters_clist
83 \clist_new:N \l__keythms_thmstyle_savedkeys_clist
84 \iow_new:N \g__keythms_listof_stream
85 \prop_new:N \g__keythms_thmnames_prop
86 \prop_new:N \g__keythms_thmuse_othercounters_prop
87 \prop_new:N \l__keythms_restate_counters_prop
88 \tl_new:N \l__keythms_thm_currentthmstyle_tl
89 \tl_new:N \l__keythms_thm_defaultkeys_tl
90 \tl_new:N \l__keythms_thm_envname_tl
91 \tl_new:N \l__keythms_thmstyle_defaultkeys_tl
92 \tl_new:N \l__keythms_thmstyle_lnotebrace_tl
93 \tl_new:N \l__keythms_thmstyle_rnotebrace_tl
94 \tl_new:N \l__keythms_thmuse_envname_tl
95 \tl_new:N \g__keythms_thmuse_temprestatedata_tl
96
97 \newcounter{keythms_restate_dummyctr}
98 \cs_gset:Npn \theHkeythms_restate_dummyctr
99   { restate.\arabic{keythms_restate_dummyctr} }
100 \cs_gset:Npn \thekeythms_restate_dummyctr { }
101 \newcounter{keythms_continues_dummyctr}
102 \cs_gset:Npn \theHkeythms_continues_dummyctr
103   { continues.\arabic{keythms_continues_dummyctr} }
104 \cs_gset:Npn \thekeythms_continues_dummyctr { }
105 \newcounter{keythms_unnumbered_dummyctr}
106 \cs_gset:Npn \theHkeythms_unnumbered_dummyctr
107   { unnumbered.\arabic{keythms_unnumbered_dummyctr} }
108 \cs_gset:Npn \thekeythms_unnumbered_dummyctr { }
109
110 \cs_generate_variant:Nn \hook_gput_code:nnn { nnV }
111 \cs_generate_variant:Nn \keys_precompile:nnN { nv, nVc }
112
113 % for detecting AMS classes
114 \prg_new_conditional:Npnn \keythms_if_amsclass: { T, TF }

```

```

115 {
116   \IfClassLoadedTF { amsart } { \prg_return_true: }
117   {
118     \IfClassLoadedTF { amsbook } { \prg_return_true: }
119     {
120       \IfClassLoadedTF { amsproc } { \prg_return_true: }
121       { \prg_return_false: }
122     }
123   }
124 }
125
126 %%%%%%%%%%%
127 %% Styles %%
128 %%%%%%%%%%%
129
130 % \__keythms_thmstyle_setbraces:nn { <left brace> } { <right brace> }
131 \cs_new_protected:Npn \__keythms_thmstyle_setbraces:nn #1#2
132 {
133   \tl_set:Nn \l__keythms_thmstyle_lnotebrace_tl { #1 }
134   \tl_set:Nn \l__keythms_thmstyle_rnotebrace_tl { #2 }
135 }
136 \cs_new_protected:Npn \keythms_thmstyle_savethmkey_reqval:n #1
137 {
138   \clist_put_right:No \l__keythms_thmstyle_savedkeys_clist
139   { \l_keys_key_str = { #1 } }
140 }
141 \cs_new_protected:Npn \keythms_thmstyle_savethmkey_optval:n #1
142 {
143   \tl_if_empty:NTF \l_keys_value_tl
144   {
145     \clist_put_right:No \l__keythms_thmstyle_savedkeys_clist
146     { \l_keys_key_str }
147   }
148   {
149     \clist_put_right:No \l__keythms_thmstyle_savedkeys_clist
150     { \l_keys_key_str = { #1 } }
151   }
152 }
153
154 \keys_define:nn { keytheorems/thmstyle }
155 {
156   spaceabove .tl_set:N = \l__keythms_thmstyle_spaceabove_tl,
157   spacebelow .tl_set:N = \l__keythms_thmstyle_spacebelow_tl,
158   bodyfont .tl_set:N = \l__keythms_thmstyle_bodyfont_tl,
159   headindent .tl_set:N = \l__keythms_thmstyle_headindent_tl,
160   headfont .tl_set:N = \l__keythms_thmstyle_headfont_tl,
161   headpunct .tl_set:N = \l__keythms_thmstyle_headpunct_tl,
162   postheadspace .tl_set:N = \l__keythms_thmstyle_postheadspace_tl,
163   break .meta:n = { postheadspace = \newline }, % add error if postheadspace set
164   break .value_forbidden:n = true,
165   notefont .tl_set:N = \l__keythms_thmstyle_notefont_tl,
166   notebraces .code:n = \exp_after:wN \__keythms_thmstyle_setbraces:nn #1,
167   headstyle .choice:,
168   headstyle / margin .code:n =
169   {
170     \cs_set:Nn \keythms_thmstyle_headcmd:nnn
171     { \makebox[Opt][r]{\NUMBER\ }\NAME\NOTE }
172   },

```

```

173 headstyle / swapnumber .code:n =
174 {
175     \cs_set:Nn \keythms_thmstyle_headcmd:nnn { \NUMBER\ \NAME\NOTE }
176 },
177 headstyle / unknown .cs_set:Np = \keythms_thmstyle_headcmd:nnn #1#2#3,
178 headformat .meta:n = { headstyle = #1 },
179 inherit-style .choice:,
180 inherit-style / plain .meta:n = {},
181 inherit-style / definition .meta:n = { bodyfont = \normalfont },
182 inherit-style / remark .meta:n =
183 {
184     headfont = \itshape,
185     bodyfont = \normalfont,
186     spaceabove = 0.5\topsep,
187     spacebelow = 0.5\topsep,
188 },
189 % thm keys that are saved for later
190 numbered .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
191 parent .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
192 numberwithin .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
193 within .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
194 sibling .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
195 numberlike .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
196 sharenumber .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
197 preheadhook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
198 postheadhook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
199 prefoothook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
200 postfoothook .code:n = \keythms_thmstyle_savethmkey_reqval:n { #1 },
201 qed .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
202 tcolorbox .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
203 tcolorbox-no-titlebar .code:n = \keythms_thmstyle_savethmkey_optval:n { #1 },
204 }
205
206 \cs_new_protected:Nn \keythms_thmstyle_thmname:n { \thmname{#1} }
207 \cs_new_protected:Nn \keythms_thmstyle_thmnumber:n { \thmnumber{#1} }
208 \cs_new_protected:Nn \keythms_thmstyle_thmnote:n { \thmnote{#1} }
209
210 %% NOTE: if these are used, user is in charge of spacing with \NAME and \NUMBER
211 %% QUESTION: should these be moved into def of \newkeytheoremstyle?
212 \cs_new:Npn \NAME { \keythms_thmstyle_thmname:n { ##1 } }
213 \cs_new:Npn \NUMBER
214 {
215     \keythms_thmstyle_thmnumber:n { \textup { ##2 } }
216 }
217 \cs_new:Npn \NOTE
218 {
219     \keythms_thmstyle_thmnote:n
220     { ~ \group_begin: % group so notefont doesn't affect headpunct
221       \exp_not:V \l__keythms_thmstyle_notefont_tl
222       \l__keythms_thmstyle_lnotebrace_tl ##3 \l__keythms_thmstyle_rnotebrace_tl
223       \group_end:
224     }
225 }
226
227 \cs_new:Npn \keythms_thmstyle_headcmd_default:nnn #1#2#3
228 {
229     \keythms_thmstyle_thmname:n { #1 }
230     \keythms_thmstyle_thmnumber:n

```

```

231     { \tl_if_empty:nF { #1 } { ~ } \exp_not:N \textup { #2 } }
232     % ~ this \tl_if_empty has no effect...
233     \keythms_thmstyle_thmnote:n
234     { ~ \group_begin: % group so notefont doesn't affect headpunct
235       \exp_not:V \l__keythms_thmstyle_notefont_tl
236       \l__keythms_thmstyle_lnotebrace_tl #3 \l__keythms_thmstyle_rnotebrace_tl
237       \group_end:
238     }
239   }
240
241   %%% <SURELY A BETTER WAY>
242   \cs_new_protected:Npn \__keythms_thmstyle_definekeylist:nn #1#2
243   {
244     \clist_const:cn { c__keythms_thmstyle_defaultkeys_ #1 _clist } { #2 }
245   }
246
247   \cs_new_protected:Npn \__keythms_thmstyle_setdefaultkeys:n #1
248   {
249     \keys_precompile:nvN { keytheorems/thmstyle }
250     { c__keythms_thmstyle_defaultkeys_ #1 _clist }
251     \l__keythms_thmstyle_defaultkeys_tl
252   }
253
254   \__keythms_thmstyle_definekeylist:nn { default }
255   {
256     spaceabove    = \topsep,
257     spacebelow    = \topsep,
258     bodyfont      = \itshape,
259     headindent    = 0pt,
260     headfont      = \bfseries,
261     headpunct     = {.),
262     postheadspace = 5pt plus 1pt minus 1pt,
263     notefont      = \fontseries\mddefault\upshape,
264     notebraces    = {({}{)},
265     headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
266   }
267   \__keythms_thmstyle_definekeylist:nn { amsart }
268   {
269     spaceabove    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
270     spacebelow    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
271     bodyfont      = \itshape,
272     headindent    = 0pt,
273     headfont      = \bfseries,
274     headpunct     = {.),
275     postheadspace = 5pt plus 1pt minus 1pt,
276     notefont      = \fontseries\mddefault\upshape,
277     notebraces    = {({}{)},
278     headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
279   }
280   \__keythms_thmstyle_definekeylist:nn { amsproc }
281   {
282     spaceabove    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
283     spacebelow    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
284     bodyfont      = \itshape,
285     headindent    = \parindent,
286     headfont      = \scshape,
287     headpunct     = {.),
288     postheadspace = 5pt plus 1pt minus 1pt,

```



```

289     notefont      = \fontseries\mddefault\upshape,
290     notebraces    = {\}\},
291     headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
292 }
293 \__keythms_thmstyle_definekeylist:nn { amsbook }
294 {
295     spaceabove    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
296     spacebelow    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
297     bodyfont      = \itshape,
298     headindent    = \parindent,
299     headfont      = \scshape,
300     headpunct     = {\.},
301     postheadspace = 5pt plus 1pt minus 1pt,
302     notefont      = \fontseries\mddefault\upshape,
303     notebraces    = {\}\},
304     headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
305 }
306 \__keythms_thmstyle_definekeylist:nn { acmart }
307 {
308     spaceabove    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
309     spacebelow    = .5\baselineskip plus .2\baselineskip minus .2\baselineskip,
310     bodyfont      = \@acmplainbodyfont,
311     headindent    = \@acmplainindent,
312     headfont      = \@acmplainheadfont,
313     headpunct     = {\.},
314     postheadspace = .5em,
315     notefont      = \@acmplainnotefont,
316     notebraces    = {\}\},
317     headstyle     = \keythms_thmstyle_headcmd_default:nnn{#1}{#2}{#3},
318 }
319
320 \IfClassLoadedTF { amsart }
321 {
322     \IfClassLoadedTF { acmart } % acmart loads amsart
323     {
324         \__keythms_thmstyle_setdefaultkeys:n { acmart }
325     }
326     {
327         \__keythms_thmstyle_setdefaultkeys:n { amsart }
328         \keys_define:nn { keytheorems/thmstyle }
329         {
330             inherit-style / remark .meta:n =
331             {
332                 headfont = \itshape,
333                 bodyfont = \normalfont,
334             }
335         }
336     }
337 }
338 {
339     \IfClassLoadedTF { amsbook }
340     {
341         \__keythms_thmstyle_setdefaultkeys:n { amsbook }
342         \keys_define:nn { keytheorems/thmstyle }
343         {
344             inherit-style / remark .meta:n =
345             {
346                 bodyfont = \normalfont,

```

```

347         },
348     }
349 }
350 {
351     \IfClassLoadedTF { amsproc }
352     {
353         \__keythms_thmstyle_setdefaultkeys:n { amsproc }
354         \keys_define:nn { keytheorems/thmstyle }
355         {
356             inherit-style / remark .meta:n =
357             {
358                 bodyfont = \normalfont,
359             },
360         }
361     }
362     { \__keythms_thmstyle_setdefaultkeys:n { default } }
363 }
364 }
365 %%% </SURELY A BETTER WAY>
366
367 \NewDocumentCommand \newkeytheoremstyle { m m }
368 {
369     \cs_if_free:cTF { th@ #1 }
370     { \keythms_thmstyle_declarestyle:nn { #1 } { #2 } }
371     { \msg_error:nnn { keytheorems } { thmstyle-defined } { #1 } }
372 }
373 \NewDocumentCommand \renewkeytheoremstyle { m m }
374 {
375     \cs_if_free:cTF { th@ #1 }
376     { \msg_error:nnn { keytheorems } { thmstyle-undefined } { #1 } }
377     { \keythms_thmstyle_declarestyle:nn { #1 } { #2 } }
378 }
379 \NewDocumentCommand \providekeytheoremstyle { m m }
380 {
381     \cs_if_free:cT { th@ #1 }
382     { \keythms_thmstyle_declarestyle:nn { #1 } { #2 } }
383 }
384 \NewDocumentCommand \declarekeytheoremstyle { m m }
385 {
386     \keythms_thmstyle_declarestyle:nn { #1 } { #2 }
387 }
388
389 \@onlypreamble \newkeytheoremstyle
390 \@onlypreamble \renewkeytheoremstyle
391 \@onlypreamble \providekeytheoremstyle
392 \@onlypreamble \declarekeytheoremstyle
393
394 \cs_new_eq:NN \keythms_thmstyle_new:nnnnnnnn \newtheoremstyle
395 \cs_generate_variant:Nn \keythms_thmstyle_new:nnnnnnnn { nVVVVVVVe }
396
397 \cs_new_protected:Npn \keythms_thmstyle_declarestyle:nn #1#2
398 {
399     \clist_clear:N \l__keythms_thmstyle_savedkeys_clist
400     \tl_use:N \l__keythms_thmstyle_defaultkeys_tl
401     \keys_set:nn { keytheorems/thmstyle } { #2 }
402     \keythms_thmstyle_new:nVVVVVVVe { #1 }
403     \l__keythms_thmstyle_spaceabove_tl
404     \l__keythms_thmstyle_spacebelow_tl

```

```

405 \l__keythms_thmstyle_bodyfont_tl
406 \l__keythms_thmstyle_headindent_tl
407 \l__keythms_thmstyle_headfont_tl
408 \l__keythms_thmstyle_headpunct_tl
409 \l__keythms_thmstyle_postheadspace_tl
410 { \text_expand:n { \keythms_thmstyle_headcmd:nnn{##1}{##2}{##3} } }
411 % Define new inherit-style key
412 \keys_define:nn { keytheorems/thmstyle }
413 { inherit-style / #1 .meta:n = { #2 } }
414 \tl_if_exist:cF { l__keythms_thmstyle_ #1 _savedkeys_tl }
415 { \tl_new:c { l__keythms_thmstyle_ #1 _savedkeys_tl } }
416 \keys_precompile:nVc { keytheorems/thm }
417 \l__keythms_thmstyle_savedkeys_clist
418 { l__keythms_thmstyle_ #1 _savedkeys_tl }
419 }
420
421 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
422 %%% Defining Theorems %%%
423 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
424
425 % FIX: reimplement these without \NewDocumentCommand and \SplitArgument
426
427 % \keythms_thm_setrefnames:n { <envname> } { <refname> or <sing,plural> }
428 \NewDocumentCommand \keythms_thm_setrefnames:nn
429 { m >\SplitArgument{1}{,}} m }
430 { \__keythms_thm_setrefnames_aux:nnn{#1}#2 }
431 \cs_new_protected:Npn \__keythms_thm_setrefnames_aux:nnn #1#2#3
432 {
433 \cs_set:cpn { #1 autorefname } { #2 }
434 \IfPackageLoadedT { cleveref }
435 {
436 \tl_if_novalue:nTF { #3 }
437 { \crefname{#1}{#2}{\textbf{??~(pl.~#2)}} }
438 { \crefname{#1}{#2}{#3} }
439 }
440 }
441 \cs_generate_variant:Nn \keythms_thm_setrefnames:nn { nV }
442
443 % \keythms_thm_setRefnames:n { <envname> } { <refname> or <sing,plural> }
444 \NewDocumentCommand \keythms_thm_setRefnames:nn
445 { m >\SplitArgument{1}{,}} m }
446 { \__keythms_thm_setRefnames_aux:nnn{#1}#2 }
447 \cs_new_protected:Npn \__keythms_thm_setRefnames_aux:nnn #1#2#3
448 {
449 \cs_set:cpn { #1 Autorefname } { #2 }
450 \IfPackageLoadedT { cleveref }
451 {
452 \tl_if_novalue:nTF { #3 }
453 { \Crefname{#1}{#2}{\textbf{??~(pl.~#2)}} }
454 { \Crefname{#1}{#2}{#3} }
455 }
456 }
457 \cs_generate_variant:Nn \keythms_thm_setRefnames:nn { nV }
458
459 \keys_define:nn { keytheorems/thm }
460 {
461 name .tl_set:N = \l__keythms_thm_name_tl,
462 title .meta:n = { name = #1 },

```

```

463 heading .meta:n = { name = #1 },
464 refname .tl_set:N = \l__keythms_thm_refname_tl,
465 Refname .tl_set:N = \l__keythms_thm_Refname_tl,
466 numbered .choice:,
467 numbered / true .code:n = \bool_set_true:N \l__keythms_thm_numbered_bool,
468 numbered / false .code:n = \bool_set_false:N \l__keythms_thm_numbered_bool,
469 numbered / yes .meta:n = { numbered = true },
470 numbered / no .meta:n = { numbered = false },
471 numbered / unless-unique .code:n =
472 {
473 \bool_set_true:N \l__keythms_thm_unlessunique_bool
474 },
475 numbered / unless-unique .meta:n = { numbered = unless-unique },
476 numbered .default:n = true,
477 parent .tl_set:N = \l__keythms_thm_parent_tl,
478 numberwithin .meta:n = { parent = #1 },
479 within .meta:n = { parent = #1 },
480 sibling .tl_set:N = \l__keythms_thm_sibling_tl,
481 numberlike .meta:n = { sibling = #1 },
482 sharenumber .meta:n = { sibling = #1 },
483 style .tl_set:N = \l__keythms_thm_style_tl,
484 style .groups:n = { style-comes-first },
485 preheadhook .tl_set:N = \l__keythms_thm_preheadhook_tl,
486 postheadhook .tl_set:N = \l__keythms_thm_postheadhook_tl,
487 prefoothook .tl_set:N = \l__keythms_thm_prefoothook_tl,
488 postfoothook .tl_set:N = \l__keythms_thm_postfoothook_tl,
489 qed .tl_set:N = \l__keythms_thm_qed_tl,
490 qed .default:n = \c_novalue_tl,
491 % ~ distinguish between 'qed' and 'qed={}'
492 tcolorbox .tl_set:N = \l__keythms_thm_tcbkeys_tl,
493 tcolorbox .default:n = {},
494 tcolorbox-no-titlebar .meta:n =
495 {
496 tcolorbox={
497 notitle,
498 before~upper={
499 \group_begin:
500 \__keythms_thm_tcbxtemphead:
501 \group_end:
502 },
503 #1
504 }
505 },
506 tcolorbox-no-titlebar .default:n = {},
507 }
508
509 % what below is unnecessary? I really don't understand this code.
510 \cs_new_protected:Npn \__keythms_thm_storeddeferredthmhead:n #1
511 {
512 \if@inlabel \indent \par \fi % eject a section head if one is pending
513 \if@nobreak
514 \adjust@parskip@nobreak
515 \else
516 \addpenalty\@beginparpenalty
517 \addvspace\@topsep
518 \addvspace{-\parskip}
519 \fi
520 % \global\@inlabeltrue % MY COMMENT: if this is uncommented then spacing after sections is wrong

```

```

521     \everypar\@everypar
522     \cs_set:Npn \__keythms_thm_tcboxtemphead: { \normalfont #1 }
523     \ignorespaces
524 }
525
526 \keys_precompile:nnN { keytheorems/thm }
527 {
528     name          = \q_no_value,
529     refname       = \q_no_value,
530     Refname       = \q_no_value,
531     numbered      = true,
532     parent        = {},
533     sibling        = {},
534     style         = {},
535     preheadhook   = {},
536     postheadhook  = {},
537     prefoothook   = {},
538     postfoothook  = {},
539     qed           = \q_no_value,
540     tcolorbox     = \q_no_value,
541 }
542 \l__keythms_thm_defaultkeys_tl
543
544 \cs_new_protected:Npn \__keythms_thm_makethmhooks:n #1
545 {
546     \hook_new:n { keytheorems/#1/prehead }
547     \hook_new:n { keytheorems/#1/posthead }
548     \hook_new_reversed:n { keytheorems/#1/prefoot }
549     \hook_new_reversed:n { keytheorems/#1/postfoot }
550     \hook_new:n { keytheorems/#1/restated }
551 }
552
553 % Make generic theorem hooks
554 \__keythms_thm_makethmhooks:n { allthms }
555
556 % \newkeytheorem{<name>}{<keys>}
557 \NewDocumentCommand \newkeytheorem { m O{} }
558 {
559     \clist_map_inline:nn { #1 } % define multiple theorems at once
560     { \keythms_thm_newkeythm:nn { ##1 } { #2 } }
561 }
562
563 \@onlypreamble \newkeytheorem
564
565 % to prevent error when plain, remark, or definition style used
566 \tl_new:N \l__keythms_thmstyle_plain_savedkeys_tl
567 \tl_new:N \l__keythms_thmstyle_remark_savedkeys_tl
568 \tl_new:N \l__keythms_thmstyle_definition_savedkeys_tl
569
570 % \keythms_thm_newkeythm:nn { <envname> } { <keys> }
571 \cs_new_protected:Npn \keythms_thm_newkeythm:nn #1#2
572 {
573     % Store envname
574     \tl_set:Nn \l__keythms_thm_envname_tl { #1 }
575     % Make unless-unique false by default (can't precompile this)
576     \bool_set_false:N \l__keythms_thm_unlessunique_bool
577     % Set default keys
578     \tl_use:N \l__keythms_thm_defaultkeys_tl

```

```

579 % First set style so we can pick up additional thm keys, then overwrite if necessary
580 \keys_set:groups:nnn { keytheorems/thm } { style-comes-first } { #2 }
581 \tl_if_empty:NF \l__keythms_thm_style_tl
582 {
583   % Store theorem style
584   \tl_set:Nx \l__keythms_thm_currentthmstyle_tl { \the\thm@style }
585   % Temporarily set theorem style
586   \__keythms_theoremstyle:n { \l__keythms_thm_style_tl }
587   % If thm keys given in style, call now (possibly overwritten in next step)
588   % but don't error if user uses a style defined with just \newtheoremstyle
589   \tl_if_exist:cT { l__keythms_thmstyle_ \l__keythms_thm_style_tl _savedkeys_tl }
590   { \tl_use:c { l__keythms_thmstyle_ \l__keythms_thm_style_tl _savedkeys_tl } }
591 }
592 % Set env-specific keys
593 \keys_set:nn { keytheorems/thm } { #2 }
594 % Set up env-specific hooks
595 \__keythms_thm_makethmhooks:n { #1 }
596 % Add to env-specific hooks (use label so code given in keys is outermost)
597 % NOTE: faster to check if empty than add empty code to hook
598 \tl_if_empty:NF \l__keythms_thm_preheadhook_tl
599 {
600   \hook_gput_code:nnV { keytheorems/#1/prehead }
601   { keythms_hook_keys } \l__keythms_thm_preheadhook_tl
602 }
603 \tl_if_empty:NF \l__keythms_thm_postheadhook_tl
604 {
605   \hook_gput_code:nnV { keytheorems/#1/posthead }
606   { keythms_hook_keys } \l__keythms_thm_postheadhook_tl
607 }
608 \tl_if_empty:NF \l__keythms_thm_prefoothook_tl
609 {
610   \hook_gput_code:nnV { keytheorems/#1/prefoot }
611   { keythms_hook_keys } \l__keythms_thm_prefoothook_tl
612 }
613 \tl_if_empty:NF \l__keythms_thm_postfoothook_tl
614 {
615   \hook_gput_code:nnV { keytheorems/#1/postfoot }
616   { keythms_hook_keys } \l__keythms_thm_postfoothook_tl
617 }
618 % Set name if none given
619 \quark_if_no_value:NT \l__keythms_thm_name_tl % use quark so name={} is valid
620 {
621   % use e so \text_titlecase called only once per theorem definition,
622   % not each time the theorem is used
623   \tl_set:Nx \l__keythms_thm_name_tl
624   { \text_titlecase_first:n { #1 } }
625 }
626 % associate formatted name with envname in prop list
627 \prop_gput:NnV \g__keythms_thmnames_prop { #1 } \l__keythms_thm_name_tl
628 % Call correct \newtheorem variant
629 \bool_if:NTF \l__keythms_thm_unlessunique_bool
630 {
631   % [unq] is required since aux is read at begindocument
632   % (technically right before) which is after theorem is defined
633   \RequirePackage[unq]{unique}
634   \tl_if_empty:NTF \l__keythms_thm_parent_tl
635   {
636     \hook_gput_code:nnn { keytheorems/#1/prehead }

```

```

637     { keythms_hook_keys } { \setuniqmark { #1 } }
638 \ifuniq{ #1 }
639   { \bool_set_false:N \l__keythms_thm_numbered_bool }
640   { \bool_set_true:N \l__keythms_thm_numbered_bool }
641 \bool_if:NTF \l__keythms_thm_numbered_bool
642   {
643     \tl_if_empty:NTF \l__keythms_thm_sibling_tl
644     {
645       \__keythms_thm_new_numbered:nV { #1 } \l__keythms_thm_name_tl
646     }
647     {
648       \exp_args:NnV \newaliascnt { #1 } \l__keythms_thm_sibling_tl
649       \__keythms_thm_new_sibling:nVn { #1 }
650       \l__keythms_thm_name_tl { #1 }
651       \aliascntresetthe { #1 }
652     }
653   }
654   {
655     \__keythms_thm_new_unnumbered:nV { #1 } \l__keythms_thm_name_tl
656     \hook_gput_code:nnn { keytheorems/#1/prehead } { keythms_hook_keys }
657     {
658       \keythms_if_restating:F
659       { \refstepcounter{ keythms_unnumbered_dummyctr } }
660     }
661   }
662 }
663 {
664   \__keythms_thm_new_uuwithparent:nVV { #1 }
665   \l__keythms_thm_name_tl \l__keythms_thm_parent_tl
666 }
667 }
668 {
669   \bool_if:NTF \l__keythms_thm_numbered_bool
670   {
671     \tl_if_empty:NTF \l__keythms_thm_parent_tl
672     {
673       \tl_if_empty:NTF \l__keythms_thm_sibling_tl
674       {
675         \__keythms_thm_new_numbered:nV { #1 } \l__keythms_thm_name_tl
676       }
677       {
678         \exp_args:NnV \newaliascnt { #1 } \l__keythms_thm_sibling_tl
679         \__keythms_thm_new_sibling:nVn { #1 }
680         \l__keythms_thm_name_tl { #1 }
681         \aliascntresetthe { #1 }
682       }
683     }
684     {
685       \__keythms_thm_new_parent:nVV { #1 }
686       \l__keythms_thm_name_tl \l__keythms_thm_parent_tl
687     }
688   }
689   {
690     \__keythms_thm_new_unnumbered:nV { #1 } \l__keythms_thm_name_tl
691     \hook_gput_code:nnn { keytheorems/#1/prehead } { keythms_hook_keys }
692     {
693       \keythms_if_restating:F
694       { \refstepcounter{ keythms_unnumbered_dummyctr } }

```

```

695     }
696   }
697 }
698 % Store theorem def and redefine it with keys
699 \keythms_keyify_theorem:n { #1 }
700 % define \<env>autorefname and \<env>Autorefname, might be redefined next
701 \exp_args:NnV \cs_set:cpn { #1 autorefname } \l__keythms_thm_name_tl
702 \exp_args:NnV \cs_set:cpn { #1 Autorefname } \l__keythms_thm_name_tl
703 % Set ref names
704 \quark_if_no_value:NF \l__keythms_thm_refname_tl
705   { \keythms_thm_setrefnames:nV { #1 } \l__keythms_thm_refname_tl }
706 \quark_if_no_value:NF \l__keythms_thm_Refname_tl
707   { \keythms_thm_setRefnames:nV { #1 } \l__keythms_thm_Refname_tl }
708 % Set up qed if needed
709 \quark_if_no_value:NF \l__keythms_thm_qed_tl
710   {
711     \exp_args:Nno \__keythms_thm_qedcode:nn { #1 } { \l__keythms_thm_qed_tl }
712   }
713 % Set up tcolorbox if needed
714 \quark_if_no_value:NF \l__keythms_thm_tcbkeys_tl
715   {
716     \exp_args:Nno \__keythms_thm_tcbboxcode:nn { #1 }
717       { \l__keythms_thm_tcbkeys_tl }
718   }
719 % Set default list-of display command
720 \__keythms_listof_show_aux:n { #1 }
721 % Set theorem style back to original state if needed
722 \tl_if_empty:NF \l__keythms_thm_style_tl
723   {
724     \__keythms_theoremstyle:V \l__keythms_thm_currentthmstyle_tl
725   }
726 }
727
728 \cs_new_protected:Npn \__keythms_thm_tcbboxcode:nn #1#2
729 {
730   \RequirePackage{tcolorbox}
731   \hook_gput_code:nnn { keytheorems/#1/prehead }
732     { keythms_tcbbox }
733   {
734     \cs_set_eq:NN \deferred@thm@head \__keythms_thm_storedeferredthmhead:n
735     \cs_set_eq:NN \Hy@theorem@makelinktarget \use_none:n
736     % ^ don't like playing with hyperref internals... but don't see around
737     % it because hyperref tries to add to para hook which doesn't work
738     % when title set up the way we do it
739     \cs_set_protected:Npn \thm@space@setup { \thm@preskip=Opt \thm@postskip=Opt }
740     % ^ to match tcolorbox defaults; shouldn't interfere with user styles
741   }
742   \hook_gset_rule:nnnn { keytheorems/#1/posthead }
743     { keythms_tcbbox } { before } { keythms_hook_keys }
744   \hook_gset_rule:nnnn { keytheorems/#1/prefoot }
745     { keythms_tcbbox } { after } { keythms_hook_keys }
746   \hook_gset_rule:nnnn { keytheorems/#1/prefoot }
747     { keythms_tcbbox } { after } { keythms_qed }
748   \bool_if:NTF \l__keythms_thm_numbered_bool
749     {
750       \hook_gput_code:nnn { begindocument } { . }
751       {
752         \IfPackageLoadedTF{cleveref}

```



```

753 { % hyperref doesn't patch \@thm if cleveref loaded
754 \hook_gput_code:nnn { keytheorems/#1/posthead }
755 { keythms_tcbox }
756 {
757 \begin{tcolorbox}[
758 savedelimiter=#1,
759 title={ \_\_keythms_thm_tcboxtemphead: },
760 #2]
761 }
762 }
763 {
764 \hook_gput_code:nnn { keytheorems/#1/posthead }
765 { keythms_tcbox }
766 {
767 \begin{tcolorbox}[
768 savedelimiter=#1,
769 title={ \_\_keythms_thm_tcboxtemphead: },
770 phantom={ \MakeLinkTarget*{\@currentHref} }, % fix hyperlinking
771 #2]
772 }
773 }
774 }
775 }
776 {
777 \hook_gput_code:nnn { keytheorems/#1/posthead }
778 { keythms_tcbox }
779 {
780 \begin{tcolorbox}[
781 savedelimiter=#1,
782 title={ \_\_keythms_thm_tcboxtemphead: },
783 #2]
784 }
785 }
786 \hook_gput_code:nnn { keytheorems/#1/prefoot }
787 { keythms_tcbox } { \end{tcolorbox} }
788 }
789 \cs_new_protected:Npn \_\_keythms_thm_qedcode:nn #1#2
790 {
791 \hook_gput_code:nnn { keytheorems/#1/posthead }
792 { keythms_qed }
793 {
794 \exp_args:No \tl_if_novalue:nF { #2 } { \protected@edef\qedsymbol{#2} }
795 \pushQED{\qed}
796 }
797 \hook_gput_code:nnn { keytheorems/#1/prefoot }
798 { keythms_qed }
799 {
800 \exp_args:No \tl_if_novalue:nF { #2 } { \protected@edef\qedsymbol{#2} }
801 \popQED
802 }
803 }
804
805 \cs_new_eq:NN \_\_keythms_theoremstyle:n \theoremstyle
806 \cs_generate_variant:Nn \_\_keythms_theoremstyle:n { V }
807
808 % \newtheorem variants
809 \cs_new_eq:NN \_\_keythms_thm_new:w \newtheorem
810

```

```

811 \cs_new_protected:Npn \__keythms_thm_new_numbered:nn #1#2
812 { \__keythms_thm_new:w { #1 } { #2 } }
813 \cs_generate_variant:Nn \__keythms_thm_new_numbered:nn { nV }
814
815 \cs_new_protected:Npn \__keythms_thm_new_unnumbered:nn #1#2
816 { \__keythms_thm_new:w* { #1 } { #2 } }
817 \cs_generate_variant:Nn \__keythms_thm_new_unnumbered:nn { nV }
818
819 \cs_new_protected:Npn \__keythms_thm_new_parent:nnn #1#2#3
820 { \__keythms_thm_new:w { #1 } { #2 } [ #3 ] }
821 \cs_generate_variant:Nn \__keythms_thm_new_parent:nnn { nVV }
822
823 \cs_new_protected:Npn \__keythms_thm_new_sibling:nnn #1#2#3
824 { \__keythms_thm_new:w { #1 } [ #3 ] { #2 } }
825 \cs_generate_variant:Nn \__keythms_thm_new_sibling:nnn { nV }
826
827 \cs_new_protected:Npn \__keythms_thm_new_uuwithparent:nnn #1#2#3
828 {
829   \cs_undefine:c { keythms_orig_nonumber_#1 } % for renew, declare
830   \__keythms_thm_new_unnumbered:nn { keythms_orig_nonumber_#1 } { #2 }
831   \__keythms_thm_new_parent:nnn { #1 } { #2 } { #3 }
832   \DeclareEnvironmentCopy { keythms_orig_withparent_#1 } { #1 }
833   \renewenvironment { #1 } % opt arg is implicit
834   {
835     \setuniqmark{ #1. \use:c {the #3} }
836     \ifuniq{ #1. \use:c {the #3} }
837     {
838       \keythms_if_restating:F
839       { \refstepcounter{ keythms_unnumbered_dummyctr } }
840       \begin{keythms_orig_nonumber_#1}
841     }
842     {
843       \begin{keythms_orig_withparent_#1}
844     }
845   }
846   {
847     \ifuniq{ #1. \use:c {the #3} }
848     { \end{keythms_orig_nonumber_#1} }
849     { \end{keythms_orig_withparent_#1} }
850   }
851 }
852 \cs_generate_variant:Nn \__keythms_thm_new_uuwithparent:nnn { nVV }
853
854 % for getting notes with continues*, use nameref if available, otherwise ltproperties
855 \hook_gput_code:nnn { begindocument } { . }
856 {
857   \IfPackageLoadedTF { nameref }
858   {
859     \cs_new:Npn \__keythms_thmuse_recordnote: { } % nameref takes care of this
860     \cs_new:Npn \__keythms_getrecordednote:n #1
861     {
862       \getrefbykeydefault{ #1 } { name } { }
863     }
864   }
865   { % needs https://github.com/latex3/latex2e/issues/1200 fixed
866     \property_new:nnnn { keytheorems/recordednote } { now } { }
867     { \l__keythms_thmuse_note_tl }
868     \cs_new:Npn \__keythms_getrecordednote:n #1

```

```

869     {
870         \property_ref:nn { keythms_recordednote_#1 }
871         { keytheorems/recordednote }
872     }
873     \cs_new:Npn \__keythms_thmuse_recordnote:
874     {
875         \tl_if_empty:NF \l__keythms_thmuse_note_tl
876         {
877             \RecordProperties
878             { keythms_recordednote_\l__keythms_thmuse_label_tl }
879             { keytheorems/recordednote }
880         }
881     }
882 }
883 }
884
885 \keys_define:nn { keytheorems/thmuse }
886 {
887     label      .tl_set:N = \l__keythms_thmuse_label_tl,
888     note       .tl_set:N = \l__keythms_thmuse_note_tl,
889     name       .meta:n   = { note = #1 },
890     % ^ for compatibility. "name" is ambiguous and doesn't match amsthm language
891     short-note .code:n   = {}, % these do nothing at point of use
892     short-name .code:n   = {}, % ^ worthwhile compatibility?
893     continues  .tl_set:N = \l__keythms_thmuse_contlabel_tl,
894     continues* .code:n   =
895     {
896         \keys_set:nn { keytheorems/thmuse } { continues = #1 }
897         \protected@edef \l__keythms_tmpa_tl { \__keythms_getrecordednote:n{#1} }
898         \tl_if_empty:NF \l__keythms_tmpa_tl
899         {
900             \keys_set:nn { keytheorems/thmuse }
901             { note = \l__keythms_tmpa_tl }
902         }
903     },
904     store      .tl_set:N = \l__keythms_thmuse_store_tl,
905     %store     .default:n = \q_no_value, % ={name} causes issues
906     restate    .meta:n   = { store = #1 },
907     % ^ thmtools compatibility
908     listhack   .choice:, % need equals sign
909     listhack / true .code:n = \bool_set_true:N \l__keythms_thmuse_listhack_bool,
910     listhack / false .code:n = \bool_set_false:N \l__keythms_thmuse_listhack_bool,
911     listhack   .initial:n = false,
912     seq        .code:n   = {},
913 }
914
915 \cs_new_protected:Npn \keythms_keyify_theorem:n #1
916 { % #1 = theorem name
917     \DeclareEnvironmentCopy { keythms_orig_#1 } { #1 }
918     \DeclareDocumentEnvironment { keythms_grab_#1 } { m O{} +b }
919     { % ##1 = keys, ##2 = note, ##3 = theorem body
920         \__keythms_thm_prehead_code:n { #1 }
921         \begin{keythms_orig_#1}[{##2}]
922         \clist_map_inline:Nn \g__keythms_restatecounters_clist
923         {
924             \prop_gput:Nne \g__keythms_thmuse_othercounters_prop { ####1 }
925             { \the\value{####1} }
926         }

```

```

927 \__keythms_thm_posthead_code:n { #1 }
928 % below needs to come after posthead so that correct \@currentHref
929 % is stored for tcolorbox theorems
930 \__keythms_thm_addcontentsdata:nnnn { #1 }
931 { \prop_to_keyval:N \g__keythms_thmuse_othercounters_prop }
932 { ##1 } { ##3 }
933 \__keythms_thm_tempstorerebasedata:nnn { #1 } { ##1 } { ##3 }
934 ##3
935 \__keythms_thm_prefoot_code:n { #1 }
936 \end{keythms_orig_#1}
937 \__keythms_thm_postfoot_code:n { #1 }
938 }
939 {}
940 % NOTE: have to do a lot of shenanigans to make sure the begin/end of grabbed
941 % theorem env captures only the body and no package code.
942 % This is the price of on-the-fly redefining the env to grab body
943 \RenewDocumentEnvironment { #1 } { = {note} 0 {} }
944 {
945 \keys_set:nn { keytheorems/thmuse } { ##1 }
946 \tl_if_empty:NF \l__keythms_thmuse_store_tl
947 {
948 \bool_gset_true:N \g__keythms_listof_writefile_bool
949 \cs_set_eq:NN \__keythms_withhooks_begin:nn \__keythms_grab_begin:nn
950 \cs_set_eq:NN \__keythms_withhooks_begin:nnn \__keythms_grab_begin:nnn
951 \cs_set_eq:NN \__keythms_withhooks_begin:nnV \__keythms_grab_begin:nnV
952 \cs_set_eq:NN \__keythms_withhooks_end:n \__keythms_grab_end:n
953 }
954 \__keythms_thm_prehead_continues_code:n { #1 }
955 \tl_if_empty:NTF \l__keythms_thmuse_note_tl
956 { \__keythms_withhooks_begin:nn { #1 } { ##1 } }
957 {
958 \__keythms_withhooks_begin:nnV { #1 } { ##1 }
959 \l__keythms_thmuse_note_tl
960 }
961 }
962 {
963 \__keythms_withhooks_end:n { #1 }
964 \tl_if_empty:NF \l__keythms_thmuse_store_tl
965 {
966 \cs_if_exist:cF
967 { __keythms_getthm_ \l__keythms_thmuse_store_tl _theorem }
968 {
969 \cs_new:cpe
970 { __keythms_getthm_ \l__keythms_thmuse_store_tl _theorem }
971 {
972 \exp_not:N \__keythms_getthm_theorem:nnnnn
973 \exp_not:o { \g__keythms_thmuse_temprestatedata_tl }
974 }
975 \cs_new:cpe
976 { __keythms_getthm_ \l__keythms_thmuse_store_tl _body }
977 {
978 \exp_not:N \__keythms_getthm_body:nn
979 \exp_args:No \exp_not:o
980 {
981 \exp_after:wN \__keythms_use_iii_v_braced:nnnnn
982 \g__keythms_thmuse_temprestatedata_tl
983 }
984 }

```

```

985     }
986   }
987 }
988 }
989 \cs_new:Npn \__keythms_use_iii_v_braced:nnnnn #1#2#3#4#5 { {#3}{#5} }
990
991 \cs_new_protected:Npn \__keythms_withhooks_begin:nn #1#2
992 { % #1 = theorem name, #2 = keys
993   \__keythms_thm_prehead_code:n { #1 }
994   \begin{keythms_orig_#1}
995   \__keythms_thm_posthead_code:n { #1 }
996   \__keythms_thm_addcontentsdata:nnnn { #1 } { } { #2 } { }
997   \ignorespaces % I hope this is alright
998 }
999 \cs_new_protected:Npn \__keythms_withhooks_begin:nnn #1#2#3
1000 { % #1 = theorem name, #2 = keys, #3 = note
1001   \__keythms_thm_prehead_code:n { #1 }
1002   \begin{keythms_orig_#1}[{#3}]
1003   \__keythms_thm_posthead_code:n { #1 }
1004   \__keythms_thm_addcontentsdata:nnnn { #1 } { } { #2 } { }
1005   \ignorespaces % I hope this is alright
1006 }
1007 \cs_generate_variant:Nn \__keythms_withhooks_begin:nnn { nnV }
1008 \cs_new_protected:Npn \__keythms_withhooks_end:n #1
1009 {
1010   \__keythms_thm_prefoot_code:n { #1 }
1011   \end{keythms_orig_#1}
1012   \__keythms_thm_postfoot_code:n { #1 }
1013 }
1014 \cs_new_protected:Npn \__keythms_grab_begin:nn #1#2
1015 { % #1 = theorem name, #2 = keys
1016   \begin{keythms_grab_#1}{#2}
1017 }
1018 \cs_new_protected:Npn \__keythms_grab_begin:nnn #1#2#3
1019 { % #1 = theorem name, #2 = keys, #3 = note
1020   \begin{keythms_grab_#1}{#2}[{#3}]
1021 }
1022 \cs_generate_variant:Nn \__keythms_grab_begin:nnn { nnV }
1023 \cs_new_protected:Npn \__keythms_grab_end:n #1 { \end{keythms_grab_#1} }
1024
1025 \cs_new_protected:Npn \__keythms_orig_begin:n #1 { \begin{keythms_orig_#1} }
1026 \cs_new_protected:Npn \__keythms_orig_begin:nn #1#2
1027 { \begin{keythms_orig_#1}[{#2}] }
1028 \cs_generate_variant:Nn \__keythms_orig_begin:nn { nV }
1029 \cs_new_protected:Npn \__keythms_orig_end:n #1 { \end{keythms_orig_#1} }
1030
1031 \cs_new_protected:Npn \__keythms_thm_prehead_code:n #1
1032 { % #1 = theorem name
1033   \tl_set:Nn \l__keythms_thmuse_envname_tl { #1 }
1034   \hook_use:n { keytheorems/#1/prehead }
1035   \hook_use:n { keytheorems/allthms/prehead }
1036 }
1037 %% this below has to be separate from prehead_code above since we need to add
1038 %% continues-code to note before retrieving it in \__keythms_withhooks_begin:nnV
1039 \cs_new_protected:Npn \__keythms_thm_prehead_continues_code:n #1
1040 { % #1 = theorem name
1041   \tl_if_empty:NF \l__keythms_thmuse_contlabel_tl
1042   {

```

```

1043 \tl_if_empty:NF \l__keythms_thmuse_note_tl
1044 { \tl_put_right:Nn \l__keythms_thmuse_note_tl { , ~ } }
1045 \tl_put_right:Ne \l__keythms_thmuse_note_tl
1046 { \__keythms_thmuse_continues:V \l__keythms_thmuse_contlabel_tl }
1047 \cs_set:cpn { the #1 }
1048 {
1049 \getrefnumber { \l__keythms_thmuse_contlabel_tl }
1050 }
1051 \cs_set_eq:cN { c@ #1 } \c@keythms_continues_dummyctr
1052 \cs_set_eq:cN { theH #1 } \theHkeythms_continues_dummyctr
1053 %\cs_set_eq:NN \setunigmark \use_none:n % not the right fix
1054 }
1055 }
1056 \cs_new_protected:Npn \__keythms_thm_posthead_code:n #1
1057 { % #1 = theorem name
1058 \hook_use:n { keytheorems/#1/posthead }
1059 \hook_use:n { keytheorems/allthms/posthead }
1060 \tl_if_empty:NF \l__keythms_thmuse_label_tl
1061 {
1062 \label{ \l__keythms_thmuse_label_tl }
1063 \__keythms_thmuse_recordnote:
1064 }
1065 \bool_if:NT \l__keythms_thmuse_listhack_bool
1066 { % straight from thm-amsthm.sty
1067 \leavevmode
1068 \vspace{-\baselineskip}%
1069 \par
1070 \everypar{\setbox\z@\lastbox\everypar{}}%
1071 }
1072 }
1073 \cs_new_protected:Npn \__keythms_thm_prefoot_code:n #1
1074 { % #1 = theorem name
1075 \hook_use:n { keytheorems/allthms/prefoot }
1076 \hook_use:n { keytheorems/#1/prefoot }
1077 }
1078 \cs_new_protected:Npn \__keythms_thm_postfoot_code:n #1
1079 { % #1 = theorem name
1080 \hook_use:n { keytheorems/allthms/postfoot }
1081 \hook_use:n { keytheorems/#1/postfoot }
1082 }
1083 \cs_new_protected:Npn \__keythms_thm_addcontentsdata:nnnn #1#2#3#4
1084 { % #1 = theorem name, #2 = stored counters, #3 = keys, #4 = body
1085 \keythms_listof_chaptervspacethack:
1086 \iow_shipout:Ne \@auxout
1087 {
1088 \exp_not:N \@writefile { thlist }
1089 {
1090 \KeyThmsSavedTheorem{ #1 }
1091 { \@currentlabel }
1092 { \@currentHref }
1093 { \thepage }
1094 { #2 }
1095 { \exp_not:n { #3 } } % do we want any expansion here, perhaps
1096 { \exp_not:n { #4 } } % with \text_expand:n ?
1097 }
1098 }
1099 }
1100 \cs_new_protected:Npn \__keythms_thm_tempstorerebasedata:nnn #1#2#3

```

```

1101 { % #1 = theorem name, #2 = keys, #3 = body
1102   \tl_gset:Nc \g__keythms_thmuse_temprestatedata_tl % needs to be global to get out of env
1103   {
1104     { #1 }
1105     { \@currentlabel }
1106     { \prop_to_keyval:N \g__keythms_thmuse_othercounters_prop }
1107     { \exp_not:n { #2 } } % do we want any expansion here, perhaps
1108     { \exp_not:n { #3 } } % with \text_expand:n ?
1109   }
1110 }
1111
1112 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1113 %% Retrieving Theorem Data %%
1114 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1115
1116 \cs_new_protected:Npn \KeyThmsSavedTheorem #1#2#3#4#5#6#7 % 7th arg is body
1117 { \use:c { __keythms_thmitem_#1:nnnnnn } {#2}{#3}{#4}{#5}{#6}{#7} }
1118
1119 \keys_define:nn { keytheorems/storeatbegin }
1120 {
1121   store .tl_set:N = \l__keythms_storeatbegin_store_tl,
1122   restate .meta:n = { store=#1 },
1123   unknown .code:n = { } % do nothing with unknown keys
1124 }
1125
1126 \cs_new_protected:Npn \KeyThmsContentsLine #1 { #1 }
1127 \NewDocumentCommand \addtheoremcontentsline { m m }
1128 {
1129   \addtocontents { thlist }
1130   {
1131     \KeyThmsContentsLine
1132     { % copied from def of \addcontentsline
1133       \protect\contentsline{#1}{#2}{\thepage}{ }
1134       \protected@file@percent
1135     }
1136   }
1137 }
1138 \NewDocumentCommand \addtotheoremcontents { m }
1139 {
1140   \addtocontents { thlist }
1141   {
1142     \KeyThmsContentsLine { #1 }
1143   }
1144 }
1145
1146 \hook_gput_code:nnn { begindocument } { . }
1147 {
1148   \group_begin:
1149   \cs_set_eq:NN \KeyThmsContentsLine \use_none:n
1150   \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1151   \cs_set_protected:Npn \KeyThmsSavedTheorem #1#2#3#4#5#6#7
1152   {
1153     \group_begin:
1154     \keys_set:nn { keytheorems/storeatbegin } { #6 }
1155     \tl_if_empty:NF \l__keythms_storeatbegin_store_tl
1156     {
1157       \cs_new_protected:cpn
1158       { __keythms_getthm_ \l__keythms_storeatbegin_store_tl _theorem }

```

```

1159         {
1160             \__keythms_getthm_theorem:nnnnn
1161             {#1}{#2}{#5}{#6}{#7}
1162         }
1163         \cs_new_protected:cpn
1164         { \__keythms_getthm_ \l__keythms_storeatbegin_store_tl _body }
1165         {
1166             \__keythms_getthm_body:nn {#5}{#7}
1167         }
1168     }
1169     \group_end:
1170 }
1171 \file_if_exist_input:n { \c_sys_jobname_str.thlist }
1172 \group_end:
1173 }
1174
1175 \prg_new_conditional:Npnn \keythms_if_restating: { T, F, TF }
1176 {
1177     \bool_if:NTF \l__keythms_thmuse_restating_bool
1178     { \prg_return_true: }
1179     { \prg_return_false: }
1180 }
1181 \NewDocumentCommand \IfRestatingTF { } { \keythms_if_restating:TF }
1182
1183 \cs_new_protected:Npn \__keythms_getthm_theorem:nnnnn #1#2#3#4#5
1184 { % #1 = name, #2 = number, #3 = restate counters, #4 = keys, #5 = theorem body
1185     \group_begin:
1186     \bool_set_true:N \l__keythms_thmuse_restating_bool
1187     \prop_set_from_keyval:Nn \l__keythms_restate_counters_prop { #3 }
1188     \prop_map_inline:Nn \l__keythms_restate_counters_prop
1189     {
1190         \tl_set:ce { l_keythms_restate_current_##1_tl } { \the\value{##1} }
1191         \setcounter { ##1 } { ##2 }
1192         % ^ FIX: what if eq's numbered by section, theorem, etc.? The
1193         %       thmtools code is opaque.... Or maybe should be up to the
1194         %       user to say "restate-counters={section,chapter,...}".
1195         \cs_set:cpn { theH ##1 } { \use:c { the ##1 } . \theHkeythms_restate_dummyctr }
1196     }
1197     \tl_if_empty:nTF { #2 }
1198     { \refstepcounter{keythms_restate_dummyctr} } % for unnumbered theorems
1199     {
1200         \cs_set:cpn { the #1 } { #2 }
1201         \cs_set_eq:cN { c@ #1 } \c@keythms_restate_dummyctr
1202         \cs_set_eq:cN { theH #1 } \theHkeythms_restate_dummyctr
1203         % ^ why are the last two line here? We shouldn't be referencing
1204         %   restated theorems. Think it's a remnant of thmtools
1205         % WRONG: needed to make numbering correct after restated theorem.
1206         % not sure about theH. <- this is needed to prevent duplicate anchors
1207     }
1208     \renewcommand\label[2][]{ } % disable \label (opt arg in case cleveref loaded)
1209     \cs_set_eq:NN \ltx@label \use_none:n % disable \ltx@label
1210     \cs_set_eq:NN \property_record:nn \use_none:nn % disable \RecordProperties
1211     \cs_set_eq:NN \setuniqmark \use_none:n % work with numbered=unless-unique
1212     % QUESTION: also disable \hyper@@anchor? \MakeLinkTarget?
1213     \keys_set:nn { keytheorems/thmuse } { #4 }
1214     \hook_use:n { keytheorems/#1/restated }
1215     \hook_use:n { keytheorems/allthms/restated }
1216     \__keythms_thm_prehead_continues_code:n { #1 }

```



```

1217 \__keythms_thm_prehead_code:n { #1 }
1218 \tl_if_empty:NTF \l__keythms_thmuse_note_tl
1219 { \__keythms_orig_begin:n { #1 } }
1220 { \__keythms_orig_begin:nV { #1 } \l__keythms_thmuse_note_tl }
1221 \__keythms_thm_posthead_code:n { #1 }
1222 #5
1223 \__keythms_thm_prefoot_code:n { #1 }
1224 \__keythms_orig_end:n { #1 }
1225 \__keythms_thm_postfoot_code:n { #1 }
1226 \prop_map_inline:Nn \l__keythms_restate_counters_prop
1227 {
1228   \exp_args:Nnc \setcounter { ##1 }
1229   { l_keythms_restate_current_##1_tl }
1230 }
1231 \group_end:
1232 }
1233
1234 \cs_new_protected:Npn \__keythms_getthm_body:nn #1#2
1235 { % #1 = restate counters, #2 = theorem body
1236   \group_begin:
1237   \bool_set_true:N \l__keythms_thmuse_restating_bool
1238   \prop_set_from_keyval:Nn \l__keythms_restate_counters_prop { #1 }
1239   \prop_map_inline:Nn \l__keythms_restate_counters_prop
1240   {
1241     \tl_set:ce { l_keythms_restate_current_##1_tl } { \the\value{##1} }
1242     \setcounter { ##1 } { ##2 }
1243     % ^ FIX: what if eq's numbered by section, theorem, etc.? The
1244     %       thmtools code is opaque.... Or maybe should be up to the
1245     %       user to say "restate-counters={section,chapter,...}".
1246     \cs_set:cpn { theH ##1 } { \use:c { the ##1 } . \theHkeythms_restate_dummyctr }
1247   }
1248   \refstepcounter{keythms_restate_dummyctr}
1249   \renewcommand\label[2] [] {} % disable \label (opt arg in case cleveref loaded)
1250   \cs_set_eq:NN \ltx@label \use_none:n % disable \ltx@label
1251   \cs_set_eq:NN \property_record:nn \use_none:nn % disable \RecordProperties
1252   \hook_use:n { keytheorems/#1/restated }
1253   \hook_use:n { keytheorems/allthms/restated }
1254   #2
1255   \prop_map_inline:Nn \l__keythms_restate_counters_prop
1256   {
1257     \exp_args:Nnc \setcounter { ##1 }
1258     { l_keythms_restate_current_##1_tl }
1259   }
1260   \group_end:
1261 }
1262
1263 % \getkeytheorem[<property>]{<tag>}
1264 \NewDocumentCommand \getkeytheorem { o m }
1265 {
1266   \cs_if_exist:cTF { __keythms_getthm_#2_theorem }
1267   {
1268     \IfNoValueTF { #1 }
1269     { \use:c { __keythms_getthm_#2_theorem } }
1270     { \use:c { __keythms_getthm_#2_#1 } }
1271   }
1272   {
1273     \textbf{??}
1274     \msg_warning:nnn { keytheorems } { no-stored-theorem } { #2 }

```

```

1275     }
1276 }
1277
1278 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1279 %%% Theorem Hooks %%%
1280 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1281
1282 %%% \addtotheoremhook[<envname>]{<hook>}{<code>}
1283 \NewDocumentCommand \addtotheoremhook { o m +m }
1284 {
1285     \__hook_if_declared:nTF { keytheorems/allthms/#2 }
1286     {
1287         \IfNoValueTF { #1 }
1288         { \hook_gput_code:nnn { keytheorems/allthms/#2 } { . } { #3 } }
1289         { \hook_gput_code:nnn { keytheorems/#1/#2 } { . } { #3 } }
1290     }
1291     {
1292         \msg_error:nnn { keytheorems } { undefined-thm-hook } { #2 }
1293     }
1294 }
1295
1296 % NOTE: I think it's OK we use the internal \__hook_if_declared:nTF above
1297 %       since we don't need to worry about the user creating new theorem hooks
1298 %       so, as we're only checking the existence of hooks created by us, it's OK.
1299
1300 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1301 %%% List of Theorems %%%
1302 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1303
1304 \keys_define:nn { keytheorems/listof }
1305 {
1306     numwidth .dim_set:N = \l__keythms_listof_numwidth_dim,
1307     numwidth .initial:n = 2.3em,
1308     ignore .code:n =
1309     {
1310         \hook_gput_code:nnn { begindocument/before } { keytheorems }
1311         { \keythms_listof_ignore:n { #1 } }
1312     },
1313     show .code:n =
1314     {
1315         \hook_gput_code:nnn { begindocument/before } { keytheorems }
1316         { \keythms_listof_show:n { #1 } }
1317     },
1318     onlynamed .code:n =
1319     {
1320         \hook_gput_code:nnn { begindocument/before } { keytheorems }
1321         { \keythms_listof_onlynamed:n { #1 } }
1322     },
1323     onlynamed .default:n = \q_no_value,
1324     onlynumbered .code:n =
1325     {
1326         \hook_gput_code:nnn { begindocument/before } { keytheorems }
1327         { \keythms_listof_onlynumbered:n { #1 } }
1328     },
1329     onlynumbered .default:n = \q_no_value,
1330     ignoreall .code:n =
1331     {
1332         \hook_gput_code:nnn { begindocument/before } { keytheorems } % in case called before theorem

```

```

1333     {
1334         \prop_map_inline:Nn \g__keythms_thmnames_prop
1335         { \__keythms_listof_ignore_aux:n { ##1 } }
1336     }
1337 },
1338 showall .code:n =
1339 {
1340     \hook_gput_code:nnn { begindocument/before } { keytheorems } % in case called before theorem
1341     {
1342         \prop_map_inline:Nn \g__keythms_thmnames_prop
1343         { \__keythms_listof_show_aux:n { ##1 } }
1344     }
1345 },
1346 title .tl_set:N = \l__keythms_listof_title_tl,
1347 title .initial:n = \GetTranslation{keythms_listof_title},
1348 swapnumber .bool_set:N = \l__keythms_listof_swapnumber_bool,
1349 swapnumber .initial:n = false,
1350 title-code .cs_set:Np = \__keythms_listof_titlecmd:n #1,
1351 no-title .bool_set:N = \l__keythms_listof_notitle_bool,
1352 no-title .initial:n = false,
1353 print-body .code:n =
1354 {
1355     \cs_set_protected:Nn \keythms_listof_listcmd:nnnnnnn
1356     {
1357         \tl_if_empty:nF { ##7 }
1358         {
1359             \__keythms_getthm_theorem:nnnnn
1360             {##1}{##2}{##5}{##6}{##7}
1361         }
1362     }
1363     \cs_set_eq:NN \KeyThmsContentsLine \use_none:n
1364     % ~ I assume we want this?
1365     \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1366 },
1367 note-code .cs_set:Np = \__keythms_listof_notecmd:n #1,
1368 note-code .initial:n = { ~ (#1) },
1369 no-continues .bool_set:N = \l__keythms_listof_nocont_bool,
1370 no-continues .initial:n = false,
1371 no-chapter-skip .bool_set:N = \l__keythms_listof_nochapskip_bool,
1372 no-chapter-skip .initial:n = false,
1373 chapter-skip-length .dim_set:N = \keythms@listof@chaptervspace@dim,
1374 chapter-skip-length .initial:n = 10pt,
1375 }
1376
1377 \hook_gput_code:nnn { begindocument } { . } % redefine these keys at begindocument
1378 {
1379     \keys_define:nn { keytheorems/listof }
1380     {
1381         ignore .code:n = \keythms_listof_ignore:n { #1 },
1382         show .code:n = \keythms_listof_show:n { #1 },
1383         onlynamed .code:n = \keythms_listof_onlynamed:n { #1 },
1384         onlynamed .default:n = \q_no_value,
1385         onlynumbered .code:n = \keythms_listof_onlynumbered:n { #1 },
1386         onlynumbered .default:n = \q_no_value,
1387         ignoreall .code:n =
1388         {
1389             \prop_map_inline:Nn \g__keythms_thmnames_prop
1390             { \__keythms_listof_ignore_aux:n { ##1 } }

```

```

1391     },
1392     showall .code:n =
1393     {
1394         \prop_map_inline:Nn \g__keythms_thmnames_prop
1395         { \__keythms_listof_show_aux:n { ##1 } }
1396     },
1397     seq .code:n = \keythms_listof_showseq:n { #1 },
1398 }
1399 }
1400
1401 \NewDocumentCommand \keytheoremset { m }
1402 {
1403     \keys_set:nn { keytheorems/listof } { #1 }
1404 }
1405
1406 \cs_new_protected:Npn \keythms_listof_ignore:n #1
1407 {
1408     \clist_map_inline:nn { #1 } { \__keythms_listof_ignore_aux:n { ##1 } }
1409 }
1410 \cs_new_protected:Npn \__keythms_listof_ignore_aux:n #1
1411 {
1412     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1413     { }
1414 }
1415
1416 \cs_new_protected:Npn \keythms_listof_show:n #1
1417 {
1418     \clist_map_inline:nn { #1 } { \__keythms_listof_show_aux:n { ##1 } }
1419 }
1420 \cs_new_protected:Npn \__keythms_listof_show_aux:n #1
1421 {
1422     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1423     {
1424         \__keythms_listof_listcmd_setup:nn { ##5 }
1425         {
1426             \keythms_listof_listcmd:nnnnnn
1427             {#1}{##1}{##2}{##3}{##4}{##5}{##6}
1428         }
1429     }
1430 }
1431
1432 \cs_new_protected:Npn \keythms_listof_onlynamed:n #1
1433 {
1434     \quark_if_no_value:nTF { #1 }
1435     {
1436         \prop_map_inline:Nn \g__keythms_thmnames_prop
1437         { \__keythms_listof_onlynamed_aux:n { ##1 } }
1438     }
1439     {
1440         \clist_map_inline:nn { #1 }
1441         { \__keythms_listof_onlynamed_aux:n { ##1 } }
1442     }
1443 }
1444 \cs_new_protected:Npn \__keythms_listof_onlynamed_aux:n #1
1445 {
1446     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1447     {
1448         \__keythms_listof_listcmd_setup:nn { ##5 }

```

```

1449         {
1450             \tl_if_empty:NF \l__keythms_listofheading_note_tl
1451             {
1452                 \keythms_listof_listcmd:nnnnnnn
1453                 {#1}{##1}{##2}{##3}{##4}{##5}{##6}
1454             }
1455         }
1456     }
1457 }
1458
1459 \cs_new_protected:Npn \keythms_listof_onlynumbered:n #1
1460 {
1461     \quark_if_no_value:nTF { #1 }
1462     {
1463         \prop_map_inline:Nn \g__keythms_thmnames_prop
1464         { \__keythms_listof_onlynumbered_aux:n { ##1 } }
1465     }
1466     {
1467         \clist_map_inline:nn { #1 }
1468         { \__keythms_listof_onlynumbered_aux:n { ##1 } }
1469     }
1470 }
1471 \cs_new_protected:Npn \__keythms_listof_onlynumbered_aux:n #1
1472 {
1473     \cs_set_protected:cpn { __keythms_thmitem_#1:nnnnnn } ##1##2##3##4##5##6
1474     {
1475         \__keythms_listof_listcmd_setup:nn { ##5 }
1476         {
1477             \tl_if_empty:nF { ##1 }
1478             {
1479                 \keythms_listof_listcmd:nnnnnnn
1480                 {#1}{##1}{##2}{##3}{##4}{##5}{##6}
1481             }
1482         }
1483     }
1484 }
1485
1486 \cs_new_protected:Npn \keythms_listof_showseq:n #1
1487 {
1488     \prop_map_inline:Nn \g__keythms_thmnames_prop
1489     { \__keythms_listof_showseq_aux:nn { #1 } { ##1 } }
1490 }
1491 \cs_new_protected:Npn \__keythms_listof_showseq_aux:nn #1#2
1492 { % #1 = seq name, #2 = theorem name
1493     \cs_set_protected:cpn { __keythms_thmitem_#2:nnnnnn } ##1##2##3##4##5##6
1494     {
1495         \__keythms_listof_listcmd_setup:nn { ##5 }
1496         {
1497             \tl_if_eq:NnT \l__keythms_listofheading_seq_tl { #1 }
1498             {
1499                 \keythms_listof_listcmd:nnnnnnn
1500                 {#2}{##1}{##2}{##3}{##4}{##5}{##6}
1501             }
1502         }
1503     }
1504 }
1505
1506 % Seems unnecessary to repeat all this for reading the keyvals from seq.

```

```

1507 % In thmtools they just hook the "thmitem" definition into the theorem declaration.
1508 %% NOTE ON ABOVE: this gives more flexibility to define different kinds of lists.
1509 %% Seeacro.sty for template idea.
1510 \keys_define:nn { keytheorems/listofheading }
1511 {
1512   note      .tl_set:N = \l__keythms_listofheading_note_tl,
1513   name      .meta:n   = { note = #1 },
1514   short-note .tl_set:N = \l__keythms_listofheading_shortnote_tl,
1515   short-name .meta:n   = { short-note = #1 },
1516   continues .tl_set:N = \l__keythms_listofheading_contlabel_tl,
1517   continues* .code:n   =
1518     {
1519       \keys_set:nn { keytheorems/listofheading } { continues = #1 }
1520       \protected@edef \l__keythms_tmpa_tl { \__keythms_getrecordednote:n{#1} }
1521       \tl_if_empty:NF \l__keythms_tmpa_tl
1522       {
1523         \keys_set:nn { keytheorems/listofheading }
1524           { note = \l__keythms_tmpa_tl }
1525       }
1526     },
1527   seq      .tl_set:N = \l__keythms_listofheading_seq_tl,
1528   unknown .code:n = { } % do nothing with unknown keys
1529   % ~ this is OK because we have total control over possible keys; if invalid
1530   % key is given to theorem then an error will be raised there
1531 }
1532
1533 \cs_new:Npn \__keythms_listof_printheadng:
1534 {
1535   \tl_if_empty:NTF \l__keythms_listofheading_shortnote_tl
1536   {
1537     \tl_if_empty:NF \l__keythms_listofheading_note_tl
1538     { \__keythms_listof_notecmd:n { \l__keythms_listofheading_note_tl } }
1539   }
1540   {
1541     \__keythms_listof_notecmd:n { \l__keythms_listofheading_shortnote_tl }
1542   }
1543 }
1544
1545 \cs_new:Npn \__keythms_listof_default_listcmd:nnnnnnn #1#2#3#4#5#6#7
1546 {
1547   \contentsline{ #1 }
1548   {
1549     \bool_if:NTF \l__keythms_listof_swapnumber_bool
1550     {
1551       \prop_item:Nn \g__keythms_thmnames_prop { #1 } ~ #2
1552     }
1553     {
1554       \numberline{ #2 }
1555       \prop_item:Nn \g__keythms_thmnames_prop { #1 }
1556     }
1557     \__keythms_listof_printheadng:
1558   }
1559   { #4 }{ #3 }
1560 }
1561
1562 % NOTE: We still need to do this setup for [print-body] so that onlynamed works
1563 \cs_new_protected:Npn \__keythms_listof_listcmd_setup:nn #1#2
1564 { % #1 = keys, #2 = list command

```

```

1565 \group_begin:
1566 \keys_set:nn { keytheorems/listofheading } { #1 }
1567 \tl_if_empty:NTF \l__keythms_listofheading_contlabel_tl
1568 { #2 }
1569 {
1570   \bool_if:NF \l__keythms_listof_nocont_bool
1571   {
1572     \tl_if_empty:NF \l__keythms_listofheading_note_tl
1573     {
1574       \tl_put_right:Nn \l__keythms_listofheading_note_tl { , ~ }
1575     }
1576     \tl_put_right:Nn \l__keythms_listofheading_note_tl
1577     {
1578       \__keythms_thmuse_continues:V \l__keythms_listofheading_contlabel_tl
1579     }
1580     #2
1581   }
1582 }
1583 \group_end:
1584 }
1585
1586 % set default listcmd
1587 \cs_new_eq:NN \keythms_listof_listcmd:nnnnnnn
1588   \__keythms_listof_default_listcmd:nnnnnnn
1589
1590 \cs_if_exist:NTF \chapter
1591 { \cs_set_protected:Npn \__keythms_listof_titlecmd:n #1 { \chapter*{#1} } }
1592 { \cs_set_protected:Npn \__keythms_listof_titlecmd:n #1 { \section*{#1} } }
1593
1594 \hook_gput_code:nnn { begindocument } { . }
1595 { % try to detect ams classes
1596   \keythms_if_amsclass:TF
1597   {
1598     \prop_map_inline:Nn \g__keythms_thmnames_prop
1599     {
1600       \cs_set:cpn { l@ #1 }
1601       {
1602         \@tocline{ 0 }{ 3pt plus 2pt }{ 0pt }
1603         { \l__keythms_listof_numwidth_dim }{ }
1604       }
1605     }
1606   }
1607   {
1608     \prop_map_inline:Nn \g__keythms_thmnames_prop
1609     {
1610       \cs_set:cpn { l@ #1 }
1611       {
1612         \@dottedtocline{ 1 }{ 1.5em }
1613         { \l__keythms_listof_numwidth_dim }
1614       }
1615     }
1616   }
1617 }
1618
1619 \keythms_if_amsclass:TF
1620 {
1621   \keys_define:nn { keytheorems/listof } % adjust to class
1622   {

```

```

1623     numwidth .initial:n = 1.5pc,
1624   }
1625   \NewDocumentCommand \listofkeytheorems { 0{} }
1626   { % title command not customizable here
1627     \bool_gset_true:N \g__keythms_listof_writefile_bool
1628     \group_begin:
1629     \keys_set:nn { keytheorems/listof } { #1 }
1630     \bool_if:NT \l__keythms_listof_nochapskip_bool
1631     {
1632       \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1633     }
1634     \legacy_if_set_false:n { @files }
1635     \bool_if:NTF \l__keythms_listof_notitle_bool
1636     {
1637       \@starttoc{ thlist }{ }
1638     }
1639     { % ams classes don't expand title enough
1640       \protected@edef \l__keythms_tmpa_tl { \l__keythms_listof_title_tl }
1641       \@starttoc{ thlist }{ \l__keythms_tmpa_tl }
1642     }
1643     \group_end:
1644   }
1645 }
1646 {
1647   \NewDocumentCommand \listofkeytheorems { 0{} }
1648   {
1649     \bool_gset_true:N \g__keythms_listof_writefile_bool
1650     \group_begin:
1651     \keys_set:nn { keytheorems/listof } { #1 }
1652     \bool_if:NT \l__keythms_listof_nochapskip_bool
1653     {
1654       \cs_set_eq:NN \KeyThmsAddvspace \use_none:n
1655     }
1656     \bool_if:NF \l__keythms_listof_notitle_bool
1657     {
1658       \l__keythms_listof_titlecmd:n { \l__keythms_listof_title_tl }
1659       \@mkboth % QUESTION: should this go in titlecmd ?
1660       { \MakeUppercase \l__keythms_listof_title_tl }
1661       { \MakeUppercase \l__keythms_listof_title_tl }
1662     }
1663     \legacy_if_set_false:n { @files }
1664     \@starttoc{ thlist }
1665     \group_end:
1666   }
1667 }
1668 % ^ unlike thmtools we don't use the class's style of \listoffigures because
1669 % we want control over title-code, no-title, etc. But this means we have to guess
1670 % things like marks, sectioning command, etc.
1671
1672 \hook_gput_code:nnn { enddocument } { . }
1673 {
1674   \bool_if:NTF \g__keythms_listof_writefile_bool
1675   {
1676     \legacy_if:nT { @files }
1677     {
1678       \iow_new:N \tf@thlist
1679       \iow_open:Nn \tf@thlist { \c_sys_jobname_str.thlist }
1680     }
1681   }
1682 }

```



```

1681     }
1682     { % if .thlist file left over from previous run but not needed, clear it
1683       \file_if_exist:nT { \c_sys_jobname_str.thlist }
1684       {
1685         \iow_open:Nn \g_tmpa_iow { \c_sys_jobname_str.thlist }
1686         \iow_close:N \g_tmpa_iow
1687       }
1688     }
1689   }
1690
1691   % chapterspacehack (code translated from thmtools)
1692   \cs_new_eq:NN \KeyThmsAddvspace \addvspace
1693   \int_new:N \g_keythms_listof_prevchapter_int
1694   \int_gset:Nn \g_keythms_listof_prevchapter_int { 1 }
1695   % ^ if this is zero, bad things happen if title-code is changed; anyways don't
1696   % need addvspace at top
1697   \cs_new_protected:Npn \keythms_listof_chaptervspacehack: { }
1698   \cs_if_exist:cT { c@chapter }
1699   {
1700     \cs_if_eq:NNF \c@chapter \relax
1701     {
1702       \cs_set_protected:Npn \keythms_listof_chaptervspacehack:
1703       {
1704         \int_compare:nNnF { \value{chapter} } = { \g_keythms_listof_prevchapter_int }
1705         {
1706           \addtocontents{ thlist }
1707           {
1708             \protect\KeyThmsAddvspace
1709             { \keythms@listof@chaptervspace@dim }
1710           }
1711           \int_gset:Nn \g_keythms_listof_prevchapter_int { \value{chapter} }
1712         }
1713       }
1714     }
1715   }
1716
1717   %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1718   %% \Autoref %%
1719   %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
1720
1721   \ProvideDocumentCommand { \Autoref } { s m }
1722   {
1723     \group_begin:
1724     \cs_set_eq:NN \HyRef@testreftype \__keythms_Autoref_testreftype:w
1725     \IfBooleanTF { #1 } { \autoref*{#2} } { \autoref{#2} }
1726     \group_end:
1727   }
1728
1729   \cs_new_protected:Npn \__keythms_Autoref_testreftype:w #1.#2\\
1730   {
1731     \cs_if_exist:cTF { #1 Autorefname }
1732     {
1733       \cs_set:Npe \HyRef@currentHtag
1734       {
1735         \exp_not:N \use:c { #1 Autorefname }
1736         \exp_not:N \c_space_token
1737       }
1738     }

```

```

1739     { \msg_warning:nnn { keytheorems } { no-Autorefname } { #1 } }
1740 }
1741
1742 %%%%%%%%%%%%%%%
1743 %%% Global Keys %%%
1744 %%%%%%%%%%%%%%%
1745
1746 \keys_define:nn { keytheorems }
1747 {
1748     restate-counters .code:n =
1749     {
1750         \clist_map_inline:nn { #1 }
1751         { \tl_new:c { l_keythms_restate_current_##1_tl } }
1752         \clist_gput_right:Nn \g__keythms_restatecounters_clist { #1 }
1753     },
1754     restate-counters .initial:n = equation,
1755     continues-code .cs_set:Np = \__keythms_thmuse_continues:n #1,
1756     continues-code .initial:n =
1757     { % not sure how best to handle this translation
1758         \GetTranslation{keythms_continues}\pageref{#1}
1759     },
1760     qed-symbol .cs_set_protected:Np = \qedsymbol,
1761     overload .code:n = \__keythms_overload_code:,
1762     overload .value_forbidden:n = true,
1763     overload .usage:n = preamble,
1764     thmtools-compat .code:n = \__keythms_thmtoolscompat_code:,
1765     thmtools-compat .value_forbidden:n = true,
1766     thmtools-compat .usage:n = preamble,
1767     store-all .code:n = \__keythms_storeall_code:,
1768     store-all .value_forbidden:n = true,
1769     store-all .usage:n = preamble,
1770     auto-translate .bool_gset:N = \g__keythms_autotranslate_bool,
1771     auto-translate .initial:n = true,
1772 }
1773
1774 \cs_generate_variant:Nn \__keythms_thmuse_continues:n { V }
1775
1776 % \keytheoremset{<options>}
1777 \NewDocumentCommand \keytheoremset { m }
1778 {
1779     \keys_set:nn { keytheorems } { #1 }
1780 }
1781
1782 \cs_new_protected:Npn \__keythms_overload_code:
1783 {
1784     \RenewDocumentCommand { \newtheorem } { smomo }
1785     {
1786         \IfBooleanTF { ##1 }
1787         { \keythms_thm_newkeythm:nn { ##2 } { name=##4, numbered=no } }
1788         {
1789             \IfNoValueTF { ##3 }
1790             {
1791                 \IfNoValueTF { ##5 }
1792                 { \keythms_thm_newkeythm:nn { ##2 } { name=##4 } }
1793                 { \keythms_thm_newkeythm:nn { ##2 } { name=##4, parent=##5 } }
1794             }
1795             { \keythms_thm_newkeythm:nn { ##2 } { name=##4, sibling=##3 } }
1796         }
1797     }

```

```

1797     }
1798 }
1799
1800 \cs_new_protected:Npn \__keythms_thmtoolscompat_code:
1801 {
1802   \ProvideDocumentCommand { \declaretheoremstyle } { 0{} m }
1803   {
1804     \declarekeytheoremstyle { ##2 } { ##1 }
1805   }
1806   \ProvideDocumentCommand { \declaretheorem } { 0{} m }
1807   {
1808     \newkeytheorem { ##2 } [ ##1 ]
1809   }
1810   \ProvideDocumentEnvironment { restatable } { 0{} m m }
1811   { % set store outside [] so keyless note is recognized
1812     \keys_set:nn { keytheorems/thmuse } { store=##3 }
1813     \begin{##2}[##1]
1814   }
1815   {
1816     \end{##2}
1817     \cs_new_protected:cpn { ##3 }
1818     { % make \foo and \foo* identical
1819       \peek_meaning_remove:NTF *
1820       { \use:c { __keythms_getthm_ ##3 _theorem } }
1821       { \use:c { __keythms_getthm_ ##3 _theorem } }
1822     }
1823   }
1824   \ProvideDocumentCommand { \listoftheorems } { } { \listofkeytheorems }
1825   \ProvideDocumentCommand { \addtotheoremheadhook } { o m }
1826   {
1827     \IfNoValueTF { ##1 }
1828     { \addtotheoremhook { prehead } { ##2 } }
1829     { \addtotheoremhook [ ##1 ] { prehead } { ##2 } }
1830   }
1831   \ProvideDocumentCommand { \addtotheoremheadhook } { o m }
1832   {
1833     \IfNoValueTF { ##1 }
1834     { \addtotheoremhook { posthead } { ##2 } }
1835     { \addtotheoremhook [ ##1 ] { posthead } { ##2 } }
1836   }
1837   \ProvideDocumentCommand { \addtotheoremfoothook } { o m }
1838   {
1839     \IfNoValueTF { ##1 }
1840     { \addtotheoremhook { prefoot } { ##2 } }
1841     { \addtotheoremhook [ ##1 ] { prefoot } { ##2 } }
1842   }
1843   \ProvideDocumentCommand { \addtotheoremfoothook } { o m }
1844   {
1845     \IfNoValueTF { ##1 }
1846     { \addtotheoremhook { postfoot } { ##2 } }
1847     { \addtotheoremhook [ ##1 ] { postfoot } { ##2 } }
1848   }
1849   \clist_new:N \l__keythms_tcbshaded_keys_clist
1850   \clist_new:N \l__keythms_tcbthmbox_keys_clist
1851   \keys_define:nn { keytheorems/thm/shaded }
1852   {
1853     textwidth .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { width=##1 },
1854     bgcolor .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { colback=##1 },

```

```

1855 rulewidth .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { boxrule=##1 },
1856 rulecolor .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { colframe=##1 },
1857 margin .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { boxsep=##1 },
1858 padding .meta:n = { margin=##1 },
1859 leftmargin .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { left~skip=##1 },
1860 rightmargin .code:n = \clist_put_right:Nn \l__keythms_tcbshaded_keys_clist { right~skip=##1 }
1861 }
1862 \keys_define:nn { keytheorems/thm/thmbox }
1863 {
1864 L .code:n =
1865 {
1866 \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1867 { keythms_tcbthmbox_L }
1868 },
1869 M .code:n =
1870 {
1871 \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1872 { keythms_tcbthmbox_M }
1873 },
1874 S .code:n =
1875 {
1876 \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1877 { keythms_tcbthmbox_S }
1878 },
1879 underline .choice:,
1880 underline / true .code:n = {},
1881 underline / false .code:n =
1882 {
1883 \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist
1884 { boxed~title~style={bottomrule=0pt} }
1885 },
1886 underline .default:n = true,
1887 nounderline .meta:n = { underline=false },
1888 cut .choice:,
1889 cut / true .code:n = {},
1890 cut / false .code:n =
1891 {
1892 \clist_put_right:Nn \l__keythms_tcbthmbox_keys_clist { unbreakable }
1893 },
1894 cut .default:n = true,
1895 nocut .meta:n = { cut=false },
1896 thickness .code:n = % could also add keys to clist with changed dims; which is better?
1897 {
1898 \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1899 { keythms_tcbbox }
1900 { \dim_set:Nn \l__keythms_tcbthmbox_thickness_dim { ##1 } }
1901 },
1902 leftmargin .code:n =
1903 {
1904 \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1905 { keythms_tcbbox }
1906 { \dim_set:Nn \l__keythms_tcbthmbox_leftmargin_dim { ##1 } }
1907 },
1908 rightmargin .code:n =
1909 {
1910 \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1911 { keythms_tcbbox }
1912 { \dim_set:Nn \l__keythms_tcbthmbox_rightmargin_dim { ##1 } }

```

```

1913     },
1914     hskip .code:n =
1915     {
1916         \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1917         { keythms_tcbox }
1918         { \dim_set:Nn \l_keythms_tcbthmbox_hskip_dim { ##1 } }
1919     },
1920     vskip .code:n =
1921     {
1922         \hook_gput_code:nnn { keytheorems/\l__keythms_thm_envname_tl/prehead }
1923         { keythms_tcbox }
1924         { \dim_set:Nn \l_keythms_tcbthmbox_vskip_dim { ##1 } }
1925     },
1926 }
1927 \dim_new:N \l_keythms_tcbthmbox_thickness_dim
1928 \dim_set:Nn \l_keythms_tcbthmbox_thickness_dim { 0.6pt }
1929 \dim_new:N \l_keythms_tcbthmbox_leftmargin_dim
1930 \dim_set:Nn \l_keythms_tcbthmbox_leftmargin_dim { 0.7\parindent } % use \parindent? thmbox does
1931 \dim_new:N \l_keythms_tcbthmbox_rightmargin_dim
1932 \dim_set:Nn \l_keythms_tcbthmbox_rightmargin_dim { Opt }
1933 \dim_new:N \l_keythms_tcbthmbox_hskip_dim
1934 \dim_set:Nn \l_keythms_tcbthmbox_hskip_dim { 0.2em }
1935 \dim_new:N \l_keythms_tcbthmbox_vskip_dim
1936 \dim_set:Nn \l_keythms_tcbthmbox_vskip_dim { 0.2em }
1937 \msg_new:nnn { keytheorems } { mdframed-undefined }
1938 {
1939     keytheorems~does~not~define~the~'mdframed'~key.~
1940     Consider~using~the~'tcolorbox'~key~instead.
1941 }
1942 \keys_define:nn { keytheorems/thm }
1943 {
1944     shaded .code:n =
1945     {
1946         \clist_clear:N \l__keythms_tcbshaded_keys_clist
1947         \keys_set:nn { keytheorems/thm/shaded } { ##1 }
1948         % FIX: surely a better way to do this
1949         \RequirePackage{tcolorbox}
1950         \pgfkeysifdefined{/tcb/keythms_tcbshaded_default/.@cmd} % even worth it?
1951         {}
1952         {
1953             \tcbset % wish I could do this outside of key but can't assume tcb loaded
1954             {
1955                 keythms_tcbshaded_default/.style=
1956                 {
1957                     sharp~corners = all,
1958                     boxrule = Opt,
1959                     left = Opt, right = Opt,
1960                     top = Opt, bottom = Opt,
1961                     parbox = false,
1962                 }
1963             }
1964         }
1965         \keys_set:ne { keytheorems/thm }
1966         {
1967             tcolorbox-no-titlebar =
1968             {
1969                 keythms_tcbshaded_default,
1970                 \l__keythms_tcbshaded_keys_clist

```

```

1971     }
1972   }
1973 },
1974 thmbox .code:n = % adapted from https://tex.stackexchange.com/a/236230/208544
1975 {
1976   \clist_clear:N \l__keythms_tcbthmbox_keys_clist
1977   \keys_set:nn { keytheorems/thm/thmbox } { ##1 }
1978   % FIX: surely a better way to do this
1979   \RequirePackage{tcolorbox}
1980   \tcbuselibrary{skins,breakable}
1981   \pgfkeysifdefined{/tcb/keythms_tcbthmbox_default/.@cmd} % even worth it?
1982   {}
1983   {
1984     \tcbset{
1985       keythms_tcbthmbox_default/.style={
1986         enhanced,
1987         breakable,
1988         sharp~corners=all,
1989         right=\l_keythms_tcbthmbox_hskip_dim,
1990         left=\l_keythms_tcbthmbox_hskip_dim,
1991         top=\l_keythms_tcbthmbox_vskip_dim,
1992         bottom=\l_keythms_tcbthmbox_vskip_dim,
1993         coltitle=black,
1994         frame~engine=empty,
1995         interior~titled~engine=empty,
1996         interior~engine=empty,
1997         extras~broken={
1998           frame~engine=empty,
1999           interior~titled~engine=empty,
2000           interior~engine=empty
2001         },
2002         parbox=false,
2003         % even though frame isn't drawn, makes spacing correct
2004         boxrule=0.5\l_keythms_tcbthmbox_thickness_dim,
2005         attach~boxed~title~to~top~left={
2006           xshift=-\l_keythms_tcbthmbox_leftmargin_dim,
2007         },
2008         boxed~title~style={
2009           empty,
2010           size=minimal,
2011           bottom=0.7ex,
2012           top=0ex,
2013           % ditto
2014           bottomrule=0.5\l_keythms_tcbthmbox_thickness_dim,
2015         },
2016         left~skip=\l_keythms_tcbthmbox_leftmargin_dim,
2017         right~skip=\l_keythms_tcbthmbox_rightmargin_dim,
2018         overlay~unbroken={
2019           \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2020             (title.south-west)
2021             --
2022             (title.south-east);
2023           \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2024             (frame.north-west)
2025             |-
2026             ([xshift=10mm]frame.south-west);
2027         },
2028         overlay~first={

```

```

2029         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2030             (title.south~west)
2031             --
2032             (title.south~east);
2033         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2034             (frame.north~west)
2035             --
2036             (frame.south~west);
2037     },
2038     overlay~middle={
2039         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2040             (frame.north~west)
2041             --
2042             (frame.south~west);
2043     },
2044     overlay~last={
2045         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2046             (frame.north~west)
2047             |-
2048             ([xshift=10mm]frame.south~west);
2049     }
2050 },
2051 keythms_tcbthmbox_L/.style={
2052     overlay~unbroken={
2053         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2054             (title.south~west)
2055             --
2056             (title.south~east);
2057         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2058             (frame.north~west)
2059             |-
2060             (frame.south~east)
2061             -|
2062             (frame.north~east);
2063     },
2064     overlay~first={
2065         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2066             (title.south~west)
2067             --
2068             (title.south~east);
2069         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2070             (frame.north~west)
2071             --
2072             (frame.south~west);
2073         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2074             (frame.north~east)
2075             --
2076             (frame.south~east);
2077     },
2078     overlay~middle={
2079         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2080             (frame.north~west)
2081             --
2082             (frame.south~west);
2083         \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2084             (frame.north~east)
2085             --
2086             (frame.south~east);

```

```

2087         },
2088         overlay~last={
2089             \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2090                 (frame.north~west)
2091                 |-
2092                 (frame.south~east)
2093                 -|
2094                 (frame.north~east);
2095         }
2096     },
2097     keythms_tcbthmbox_M/.style={},
2098     keythms_tcbthmbox_S/.style={ % first and middle same as M
2099         overlay~unbroken={
2100             \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2101                 (title.south~west)
2102                 --
2103                 (title.south~east);
2104             \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2105                 (frame.north~west)
2106                 --
2107                 (frame.south~west);
2108         },
2109         overlay~last={
2110             \draw[line~width=\l_keythms_tcbthmbox_thickness_dim]
2111                 (frame.north~west)
2112                 --
2113                 (frame.south~west);
2114         }
2115     },
2116 }
2117 }
2118 \keys_set:ne { keytheorems/thm }
2119 {
2120     tcolorbox =
2121     {
2122         keythms_tcbthmbox_default,
2123         \l__keythms_tcbthmbox_keys_clist
2124     }
2125 }
2126 },
2127 thmbox .default:n = M,
2128 mdframed .code:n = \msg_error:nn { keytheorems } { mdframed-undefined },
2129 }
2130 }
2131
2132 \cs_new_protected:Npn \__keythms_storeall_code:
2133 {
2134     \cs_set_eq:NN \__keythms_withhooks_begin:nn \__keythms_grab_begin:nn
2135     \cs_set_eq:NN \__keythms_withhooks_begin:nnn \__keythms_grab_begin:nnn
2136     \cs_set_eq:NN \__keythms_withhooks_begin:nnV \__keythms_grab_begin:nnV
2137     \cs_set_eq:NN \__keythms_withhooks_end:n \__keythms_grab_end:n
2138 }
2139
2140 \hook_gput_code:nnn { begindocument/before } { . }
2141 { % use 'provide' in case user defines their own translation in preamble
2142     \ProvideTranslationFallback { keythms_listof_title } { List~of~Theorems }
2143     \ProvideTranslationFallback { keythms_continues } { continuing~from~p.\, }
2144     \bool_if:NT \g__keythms_autotranslate_bool

```



```

2145     {
2146         \ProvideTranslation { English } { keythms_listof_title } { List~of~Theorems }
2147         \ProvideTranslation { English } { keythms_continues } { continuing~from~p.\, }
2148         % from DeepL; I don't know these languages!
2149         \ProvideTranslation { French } { keythms_listof_title } { Liste~des~théorèmes }
2150         \ProvideTranslation { French } { keythms_continues } { suite~de~la~p.\, }
2151         \ProvideTranslation { German } { keythms_listof_title } { Liste~der~Theoreme }
2152         \ProvideTranslation { German } { keythms_continues } { weiter~von~Seite~ }
2153         \ProvideTranslation { Spanish } { keythms_listof_title } { Lista~de~teoremas }
2154         \ProvideTranslation { Spanish } { keythms_continues } { continúa~de~la~p.\, }
2155     }
2156 }
2157
2158 \ProcessKeyOptions[keytheorems]
2159
2160 \file_input_stop:

```

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