mytheorem

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1 General description

The LaTeX package `mytheorem.sty` allows to create easily theorem environments with many style parameters. It is an extension of the package `theorem.sty` of Frank Mittlebach. It loads automatically ''amsmath.sty" and "amssymb.sty" and, for mathematics, it is not necessary to load an other package. Moreover a package (`demonstration.sty` containing three environments "`proof`"(in particular the one of "`amsthm.sty`") can be loaded with option [dem] (so charging `mytheorem` with `\usepackage[dem]{mytheorem}`).) **Attention** this option makes `mytheorem` incompatible with all other theorem package as, for example, `theorem`, `ntheorem`, `amsthm`, etc... because those define also the environment `proof`.

It uses the following seven packages: `boites.sty`, `xargs.sty`, `tcolorbox.sty`, `mdframed.sty` (with option [framemethod=TikZ]), `xcolor.sty`, `pstricks.sty` and `ifthen.sty` (these packages are present on a recent standard distribution of TeXLive (2017 or newer)).

`mytheorem` is loaded as usual in the LaTeX preamble with `\usepackage{mytheorem}` or `\usepackage[dem]{mytheorem}`.

Each theorem environment contain two parts: the head and the body. The head is composed of a possible label, a possible number and a possible optional argument. The body, which is the text of the theorem, can be put in a colored box under the head.

The environments depend of a type choice, and, for each type, of a style option for the head which control the formatting the head and the body font, and, for predefined types, of a second style option controlling a possible colored box containing all the theorem or only the body of the theorem. Moreover, when the body is in a box under the head, an other parameter allow to modify the vertical space between the head and the body. Finally, when all the theorem is put in a box with the body under the head or when the body is in a box under the head, by default, the head is also put in a colored box.

In all what follows "Theorem with label" means the head contain a generic name (Theorem, Proposition, Lemma, Corollary etc...) which is choosen either in the definition command of the environment in the LaTeX preamble and then it is, by default, written in bold, or in the optional argument of theorems which must be formatted correctly. "Theorem without label" means that in the definition of the environment in the LaTeX preamble the generic name is not choosen and the head is constructed with the optional argument of theorems which is then written, by default, in bold.

2 Definition of environments

2.1 Commands for definition of environments

Theorems with labels (section 2.3)

These theorems may be numbered or not. The numbered are defined in the LaTeX preamble with the command

`\newmytheorem[box]{type}[style]{font of the body}[bars/box/mdframed]{name}[counter]{label}[vertical separation]`

the not numbered with the command

`\newmytheoremn[box]{type}[style]{font of the body}[bars/box/mdframed]{name}{label}[vertical separation]`

Theorems without labels (section 2.4)

These theorems may be numbered or not. The numbered are defined with the command

`\newmytheoremw[box]{type}[style]{font of the body}[bars/box/mdframed]{name}[counter]{}[vertical separation]`

the other with

`\newmytheoremwn[box]{type}[style]{font of the body}[bars/box/mdframed]{name}{}[vertical separation]`

Arguments between braces (`{...}`) are **obligatory** and, at least, `{}` must be write if there is a default, which is the case

of {type} and {font of the body}. Arguments between hooks ([...]) are optional (i.e. they are not typed when they are not used: **never** type []).

    The possible choice for {type} are:

default type: empty

predefined types, ten possible choices:

    theoreme| proposition| corollaire| lemme| definition| notation| remarque| exercice| exemple| conjecture

    The default type correspond to the environments of the classical package theorem.

    Attention: contrary to classical command \newtheorem, with the commands \newmytheorem(w) if a precise counter is not choosen (i.e. [counter] not used), the name of the counter created by default **is not necessarily** the name of the environment defined with option {name} (see in the examples below each case). To choose a particular counter it has to be defined with the command \newcounter[2]

    The obligatory argument {font of the body} allows to modify the default font of the body. The default is \normalfont\itshape for all types except for definition| notation| remarque| exercice| exemple for which it is \normalfont\upshape. **Attention**: here only basic commands similar to the default one and a font command like \myfont[1] can be used.

    The last optional argumen [vertical separation] allows, in certain cases, with a positive measure, either to lower all the environment either to lower the body of the theorem. His default is 0pt.

    These four commands are the only ones which has to be written in the LaTeXpreamble .

    Attention: contrary to the commands of the classical theorem packages with mytheorem **never** write the command \theoremstyle{...}: these are the above commands which, with the choosen parameters, write \theoremstyle{...}.

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1. A command \myfont is defined in the LaTeX preamble in the following way:
   \newfont\myfont{file.tfm scaled xxxx}
   where "file.tfm" is the tfm file of the font and "scaled xxxx" is the optional scale commande, the base size being 1000

2. A new counter, for example C, is defined by the command: \newcounter{C}. If this counter has to be subordinate to an other counter, for example D, the command is: \newcounter{C}[D]; then, if the counter has to be written (in arabic numbers) C.D, the following command has to be added: \def\theC{\theD.\@arabic\c@C}

In the sections section 2.3 et section 2.4 it is given, with, each time, an example using all parameters by default, all combinations of possible options of these four commands. *Any other combination produce either a non desired result either an unusable result or an error of compilation.*

    The default type contain: 6 possible combinations numbered with label, 2 possible combinations not numbered with label, 4 possible combinations numberd without label and 2 possible combinations not numbered without label. So in total 14 possible combinations.

    Each predefined type contain: 10 possible combinations numbered with label, 10 possible combinations not numbered with label, 19 possible combinatsons numbered without label and 10 possible combinations not numbered without label. So in total 49 possible combinations.

Table of all usable configurations

Label	Type	Numbering	Command
With Label	**default**	**Numbered (section 2.3.1)**	\newmytheorem{}{}{name}([counter]){label}1
			\newmytheorem{}[break]{}{name}([counter]){label}2
			\newmytheorem{}[change]{}{name}([counter]){label}3
			\newmytheorem{}[changebreak]{}{name}([counter]){label}4
			\newmytheorem{}[margin]{}{name}([counter]){label}5
			\newmytheorem{}[marginbreak]{}{name}([counter]){label}6
		Not Numbered	\newmytheoremn{}{}{name}{label}
			\newmytheoremn{}[break]{}{name}{label}
	predefined (type)	**Numbered (([counter])) or no ((n))**	**without option [box] (section 2.3.2.1)**
			\newmytheorem(n){type}{}{name}([counter]){label}7
			\newmytheorem(n){type}{}[box]{name}([counter]){label}8
			\newmytheorem(n){type}{}[mdframed]{name}([counter]){label}9
			\newmytheorem(n){type}[break]{}{name}([counter]){label}10
			\newmytheorem(n){type}[break]{}[box]{name}([counter]){label}11
			\newmytheorem(n){type}[break]{}[mdframed]{name}([counter]){label}12
			with option [box]=[b] (section 2.3.2.2)

```
\newmytheorem(n)[b]{type}{}{name}([counter]){label}13
\newmytheorem(n)[b]{type}{}[onebar]{name}([counter]){label}14
\newmytheorem(n)[b]{type}{}[twobar]{name}([counter]){label}15
\newmytheorem(n)[b]{type}{}[box]{name}([counter]){label}16
```

Without Label			
	default	**Numbered (section 2.4.1.1)**	`\newmytheoremw{}{}{name}([counter]){}`17 `\newmytheoremw{}[changebreak]{}{name}([counter]){}`18 `\newmytheoremw{}[margin]{}{name}([counter]){}`19 `\newmytheoremw{}[marginbreak]{}{name}([counter]){}`20
	default	**Not Numbered (section 2.4.2.1)**	`\newmytheoremwn{}{}{name}`40 `\newmytheoremwn{}[break]{}{name}`41
	predefined (type)	**Numbered**	**without option** `[box]` **(section 2.4.1.2)** `\newmytheoremw{type}{}{name}([counter]){}`21 `\newmytheoremw{type}[changebreak]{}{name}([counter]){}`22 `\newmytheoremw{type}[margin]{}{name}([counter]){}`23 `\newmytheoremw{type}[marginbreak]{}{name}([counter]){}`24 `\newmytheoremw{type}{}[box]{name}([counter]){}`25 `\newmytheoremw{type}[changebreak]{}[box]{name}([counter]){}`26 `\newmytheoremw{type}{}[mdframed]{name}([counter]){}`27 `\newmytheoremw{type}[changebreak]{}[mdframed]{name}([counter]){}`28 `\newmytheoremw{type}[margin]{}[box]{name}([counter]){}`29 `\newmytheoremw{type}[marginbreak]{}[box]{name}([counter]){}`30 `\newmytheoremw{type}[marginbreak]{}[mdframed]{name}([counter]){}`31 **with option** `[box]=[b]` **(section 2.4.1.3)** `\newmytheoremw[b]{type}{}{name}([counter]){}`32 `\newmytheoremw[b]{type}{}[onebar]{name}([counter]){}`33 `\newmytheoremw[b]{type}{}[twobar]{name}([counter]){}`34 `\newmytheoremw[b]{type}{}[box]{name}([counter]){}`35 `\newmytheoremw[b]{type}[margin]{}{name}([counter]){}`36 `\newmytheoremw[b]{type}[margin]{}[onebar]{name}([counter]){}`37 `\newmytheoremw[b]{type}[margin]{}[twobar]{name}([counter]){}`38 `\newmytheoremw[b]{type}[margin]{}[box]{name}([counter]){}`39
	predefined (type)	**Not Numbered**	**without option** `[box]` **(section 2.4.2.2)** `\newmytheoremwn{type}{}{name}`42 `\newmytheoremwn{type}{}[box]{name}`43 `\newmytheoremwn{type}{}[mdframed]{name}`44 `\newmytheoremwn{type}[break]{}{name}`45 `\newmytheoremwn{type}[break]{}[box]{name}`46 `\newmytheoremwn{type}[break]{}[mdframed]{name}`47 **with option** `[box]=[b]` **(section 2.4.2.3)** `\newmytheoremwn[b]{type}{}{name}`48 `\newmytheoremwn[b]{type}{}[onebar]{name}`49 `\newmytheoremwn[b]{type}{}[twobar]{name}`50 `\newmytheoremwn[b]{type}{}[box]{name}`51

2.2   Basic personalizations of environments

Simple Personalizations (by `type`**)**

Default Type (i.e. `{type}={}`**)**

The label font is configured with the command `\theoremheaderfont` (default: `\bfseries\upshape`).
The counter font is configured xith the command `\Ntheoremheaderfont` (default: `\bfseries\upshape`).
These commande can be redefined with `\def{command}{choice}`

Predefined Type

The label font is configured with the command `\typefont` (default: `\bfseries\upshape`)
The counter font is configured with the command `\Ntypefont` (default: `\bfseries\upshape`)

☞ when the option `[barres/box/mdframed]=[box]` is used

- the color of the background of the box is `colortypebox` (default: `\definecolor{colortypebox}{RGB}{255,255,235}`)[1]

- the color of the text in the box and of the border of the box is \color*type*boxtext (default: empty (black)); to change it redefine the command with the syntax of pstricks[2] (it is not possible to use classical color commands like \textcolor for a phrase which takes more than one line!)
  - The left margin of the box can be modify redefining the command \leftmargin*type*box (avec \def\leftmargin*type*box{*measure*}). The default is 0pt.
  - with option [box]=[b] the option [vertical separation] allows to enlarge the vertical separation between the head and the body
  - without option [box]=[b] and with the style [break] the option [vertical separation] allows to lower all the environment with respect to the box constructed with [barres/box/mdframed]=[box]

☛ when option [barres/box/mdframed]=[mdframed] is used

  - the color of the background of the box is color*type*mdf (default: \definecolor{color*type*mdf}{RGB}{255,255,235})[1]
  - the color of the border of the box is linecolor*type* (default: \definecolor{linecolor*type*}{RGB}-{0,0,0})[1]
  - the color of the text in the box is fontcolor*type* (default: \definecolor{fontcolor*type*}{RGB}{0,0,0})[1]

☛ when option [barres/box/mdframed]=[box] is used with [style]=[break] or [boite]=[b] and when option [barres/box/mdframed]=[mdframed] is used with [style]=[break], by default, the head is put in a box (tcbox of package tcolorbox) with:

  - the background color of that box is cbl*type* (default: \definecolor{cbl*type*}{RGB}{255,255,250})[1]
  - the color of the borders of that box is cfl*type* (default: \definecolor{cfl*type*}{RGB}{0,0,0})[1]

☛ when option [boite]=[b] is used with [barres/box/mdframed]=[onebar] or [barres/box/mdframed]=[twobar]

  - the color of the bar(s) is defined by the command \color*type*breakbar (default: \black); to modify it redefine the command with pstricks[2] syntax
  - the separation between the bars is defined by the command \seprule*type*breaktwobar (default: 1.5pt which can be modify with \def\seprulebreaktwobar{*measure*})
  - The margin at the left of the bar(s) is defined by the command \leftmargin*type*breakbar (default: 2.3\parindent which can be modify with \def\leftmargin*type*breakbar{*measure*}
  - The color of the text is changed with the usual command (\textcolor, repeated at each paragraph) in the body of the theorem
  - The option [vertical separation] (with a positive measure) allows to enlarge the vertical separation between the head and the body and, with the style [break] and option [barres/box/mdframed]=[box], to lower all environment with respect to the box [box] containing it

Notice that all commands described above depend only on the type*. So they apply to **all** environments associated to the choosen* type*.*

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1. To redefine the color color*type*box (or color*type*mdf or linecolor*type* or cbl*type* or cfl*type*) the syntax is: \colorlet{color*type*box}{*color*} where *color* is a combination of predefined colors of the package xcolor: red, green, blue, cyan, magenta, yellow, black, gray, white, darkgray, lightgray, brown, lime, olive, orange, pink, purple, teal, violet followed by !n where n is a number between 0 and 100; for example: \colorlet{color*type*box}{red!10!blue!10}

2. To redefine the color \color*type*boxtext (or \color*type*breakbar) the syntax is: \newrgbcolor{color*type*boxtext}{r g b} où r, g, b, are decimal numbers between 0 and 1 representing proportions of red, green and blue

In the two next sections (2.3 and 2.4) all examples with predefined type are given with the type theoreme. Then the style files used are the files thmxxx.sty. For each type the names of these files are described in section 3.

2.3 Theorems with labels

Here we give only numbered examples, without particular choice of counter (i.e. counter by default).

2.3.1 Default Type (i.e. {type}={})

> **Numbered**: six [style] avaiable: `plain` (default), `break`, `change`, `changebreak`, `margin`. and `marginbreak`.
> **Not Numbered**: two [style] avaiable: `plain` (default), `break`
>   The styles `change`, `changebreak`, `margin`. and `marginbreak`. has to be used ***only with*** optionnal argument for theorems.
>   The options [box], [bars/box/mdframed] and [vertical separation] are not useful.

Here all counters are put on the counter of sub-sub-sections with the command \numberwithin{name of theorem}-{subsubsection}.

Simple Personalizations of these environments: see Simple Personalizations.

Advance Personalizations see section 3.1.1.

1   default (`plain`) (style file used: mythp.sty; not numbered: mythnnp.sty):

Theorem 2.3.1.1 (Rolle's Theorem). *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ et telle que $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheorem{}{}{thm}{Theorem}

2   break (style file used: mythb.sty; not numbered: mythnnb.sty):

Theorem 2.3.1.1 (Rolle's Theorem).
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ et telle que $f(a) = f(b)$.
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheorem{}[break]{}{thmbr}{Theorem}

3   change (style file used: mythc.sty) (the optional argument of theorems typed here is
"\hspace*{-\parindent}\ Theorem ({\normalfont Rolle's Theorem}).", see section 3.3.1):

2.3.1.1 Theorem (Rolle's Theorem). *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ et telle que $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheorem{}[change]{}{thmch}{}

4   changebreak (style file used: mythcb.sty) (the optional argument of theorems typed here is
"\hspace*{-\parindent}\ Theorem ({\normalfont Rolle's Theorem}).", see section 3.3.1):

2.3.1.1 Theorem (Rolle's Theorem).
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheorem{theoreme}[changebreak]{}{thmchbr}{}

5   margin (style file used: mythm.sty) (the optional argument of theorems typed here is
"Theorem ({\normalfont Rolle's Theorem})."):

2.3.1.1   **Theorem** (Rolle's Theorem). *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ et telle que $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheorem{theoreme}[margin]{}{thmma}{}

6   marginbreak (style file used: mythmb.sty) (the optional argument of theorems typed here is
"Theorem ({\normalfont Rolle's Theorem})."):

2.3.1.1   **Theorem** (Rolle's Theorem).
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheorem{theoreme}[marginbreak]{}{thmmabr}{}

2.3.2 Predefined Types (examples with type `theoreme`)

2.3.2.1 Without option `[box]`

> **Important Remarks**:
>
> ☛ when these theorems are numbered and no choice of precise counter is done, the name of the counter automatically defined is the *name* of the theorem **except** when the option `[bars/box/mdframed]` is used with `[box]` or `[mdframed]` in which case its name is *name*box if `[bars/box/mdframed]=[box]` and *name*mdf if `[bars/box/mdframed]=[mdframed]`.
>
> ☛ With option `[bars/box/mdframed]=[box]` **never** type a label (for crossed references) at the beginning of the nody (if not the box consider there is an empty line of length nul at teh beginning!) but after the first word.
>
> ☛ With option `[bars/box/mdframed]=[mdframed]` the theorem environment have two optional arguments: the first is the optional argument of theorems and the second allows to forbid any jump of page in the box containing the Theorem (this is to avoid that the bottom border of the box is alone on the top of a page). These twoarguments are empty by default and must be separated by a obligatory argument which implies that the theorem must be called with
> `\begin{nom}{}` without any optional argument, or
> `\begin{nom}[optional argument of theorem]{}`, or
> `\begin{nom}{}[nobreak]` to forbid any jump of page in the box, or
> `\begin{nom}[optional argument of theorem]{}[nobreak]` to forbid any jump of page in the box
> Consequently these environments can be used safely if the document does not contain any theorem whose length is not larger than one page.
>
> **Simple Personalizations of these environments**: see Simple Personalizations

> Two `[style]` available: `plain` (default) and `break` (the styles `change`, `changebreak`, `margin`, `marginbreak` *must not be used* they give theorems without label). Two possible styles `[bars/box/mdframed]` `box` and `mdframed` (the other give nothing).

Advanced Personalizations see: section 3.1.2.1.

Here all counters are put on the counter of sub-sub-sub-sections with the command `\numberwithin{`*name of counter*`}{paragraph}` (see name of counter).

⑦ `[style]`=default (`plain`), `[bars/box/mdframed]` not used (style file used: thmplain.sty; not numbered: thmnnplain.sty):

Theorem 2.3.2.1.1 (Rolle's Theorem). *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ et telle que $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheorem{theoreme}{}{thdef}{Theorem}

⑧ `[style]`=default (`plain`), `[bars/box/mdframed]`=box (style file used: thmplain.sty; not numbered: thmnnplain.sty):

Theorem 2.3.2.1.1 (Rolle's Theorem). *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheorem{theoreme}{}[box]{thdefbox}{Theorem}

⑨ `[style]`=default (`plain`), `[bars/box/mdframed]`=mdframed (*use with circumspection*!) (style file used: thmplain.sty; not numbered: thmnnplain.sty):

Theorem 2.3.2.1.1 (Rolle's Theorem). *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheorem{theoreme}{}[mdframed]{thdefmdf}{Theorem}

⑩ `[style]`=break, `[bars/box/mdframed]` not used (style file used: thmbreak.sty; non numéroté: thmnnbreak.sty)[1]:

---

[1]**Attention**: The body of the theorem is not in a protected box (as with option `[box]=[b]`). Consequently if the first line of the body contain, for example, a formula with a fraction, it is possible that this line comes above the head. Then a vertical space must be added at the beginning of the body with a command similar to the following: "`\quad\vspace*{-\baselineskip}\\`*space*" .

Theorem 2.3.2.1.1 (Rolle's Theorem)**.**
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ et telle que $f(a) = f(b)$.
  Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
  Command: \newmytheorem{theoreme}[break]{}{thbr}{Theorem}

11 [style]=break, [bars/box/mdframed]=box (style file used: thmbox.sty; not numbered: thmnnbox.sty)
(footnote (1), see also section 3.3.5):

> **Theorem 2.3.2.1.1** (Rolle's Theorem)**.**
>
> *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
>   *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
>   *Command:* \newmytheorem{theoreme}[break]{}[box]{thbrbox}{Theorem}

12 [style]=break, [bars/box/mdframed]=mdframed (*use with circumspection*!) (style file used: thmmdf.sty; not numbered: thmnnmdf.sty) (footnote (1), see also section 3.3.5):

> **Theorem 2.3.2.1.1** (Rolle's Theorem)**.**
>
> *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
>   *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
>   *Command:* \newmytheorem{theoreme}[break]{}[mdframed]{thbrmdf}{Theorem}

2.3.2.2 With option [box]=[b]

> The body is automatically in a box (constructed with package boites.sty) below the label.
> **Simple Personalizations of these environments**: see Simple Personalizations

> Option [style] is désactivated. Three styles [bars/box/mdframed] available onebar, twobar and box (option mdframed is not useful because of problems of jump page possible between the label and the body).

Advanced Personalizations see: section 3.1.2.2
Here all counters are put on the counter of sub-sub-sub-sections with the command \numberwithin{*name of theorem-*}{paragraph}.

13 [bars/box/mdframed] not used (style file used: thmbreak.sty; not numbered: thmnnbreak.sty):

Theorem 2.3.2.2.1 (Rolle's Theorem)**.**
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ et telle que $f(a) = f(b)$.
  Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
  Command: \newmytheorem[b]{theoreme}{}{thb}{Theorem}

14 [bars/box/mdframed]=onebar (style file used: thmbreak.sty; not numbered: thmnnbreak.sty):

Theorem 2.3.2.2.1 (Rolle's Theorem)**.**
  Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.
    Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
    Command: \newmytheorem[b]{theoreme}{}[onebar]{thbonebar}{Theorem}

15 [barres/box/mdframed]=twobar (style file used: thmbreak.sty; not numbered: thmnnbreak.sty):

Theorem 2.3.2.2.1 (Rolle's Theorem)**.**
  Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.
    Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
    Command: \newmytheorem[b]{theoreme}{}[twobar]{thbtwobar}{Theorem}

16 [barres/box/mdframed]=box (style file used: thmbox.sty; not numbered: thmnnbox.sty):

Theorem 2.3.2.2.1 (Rolle's Theorem)**.**

Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheorem[b]{theoreme}{}[box]{thbbox}{Theorem}

2.4 Theorems without label

These environments must be used *with* the optionnal argument of theorems: the purpose is to have theorems whose label can be modify at each use: Thus the optionnal argument of theorems replace the label of theorems with label and, by default, it is formatted exactly like the label in theorems with label.

As the label can vary, when they are numbered, the number is not put after the label but before or in the margin: only the styles `change`, `changebreak`, `margin` and `marginbreak` are available.

Important Remarks: see Important Remarks.

Simple Personalizations of these environments: see Simple Personalizations

We give here examples numbered and not numbered, their configurations being different, without particular choice of counter (i.e. counter by default).

2.4.1 Theorems numbered without label

2.4.1.1 Type by default (i.e. `{type}={}`)

Four `[style]` available: `change` (default), `changebreak`, `margin` and `marginbreak`. Options `[box]`, `[bars/box/mdframed]` and `[vertical separation]` not useful.

Advanced Personalizations see: section 3.2.1

Here all counters are put on the counter of sub-sub-sub-sections with the command \numberwithin{name of theorem}-{paragraph}

17 `[style]`=default `(change)` (style file used: mythc.sty):

2.4.1.1.1   Rolle's Theorem. *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheoremw{}{}{thwdefc}{}

18 `[style]`=changebreak (style file used: mythcb.sty) (footnote (1)):

2.4.1.1.1   Rolle's Theorem.
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheoremw{}[changebreak]{}{thwdefcb}{}

19 `[style]`=margin (style file used: mythm.sty):

2.4.1.1.1   Rolle's Theorem. *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheoremw{}[margin]{}{thwdefm}{}

20 `[style]`=marginbreak (style file used: mythmb.sty) (footnote (1)):

2.4.1.1.1   Rolle's Theorem.
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheoremw{}[marginbreak]{}{thwdefmb}{}

2.4.1.2 Predefined Type without option `[box]`

> Four `[style]` available: change (default), `changebreak`, `margin` and `marginbreak`. Two styles `[barres/box/mdframed]` available box and `mdframed` (the other give nothing).

Advance Personalizations see: section 3.2.2.1

Here all counters are put on the counter of sub-sub-sub-sections with the command \numberwithin{*name of counter*}-{paragraph} (see name of counter).

21 `[style]`=default `(change)`, `[bars/box/mdframed]` not used (style file used: thmchange.sty):

2.4.1.2.1 **Rolle's Theorem.** *Let f a continuous function on a segment* $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *et telle que* $f(a) = f(b)$.
Then there exists $c \in]a,b[$ *such that* $f'(c) = 0$.
Command: \newmytheoremw{theoreme}{}{thwc}{}

22 `[style]`=changebreak, `[bars/box/mdframed]` not used (style file used: thmchangebreak.sty) (footnote (1)):

2.4.1.2.1 **Rolle's Theorem.**
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *and such that* $f(a) = f(b)$.
Then there exists $c \in]a,b[$ *such that* $f'(c) = 0$.
Command: \newmytheoremw{theoreme}[changebreak]{}{thwcb}{}

23 `[style]`=margin, `[bars/box/mdframed]` not used (style file used: thmmargin.sty):

2.4.1.2.1 **Rolle's Theorem.** *Let f a continuous function on a segment* $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *et telle que* $f(a) = f(b)$.
Then there exists $c \in]a,b[$ *such that* $f'(c) = 0$.
Command: \newmytheoremw{theoreme}[margin]{}{thwm}{}

24 `[style]`=marginbbreak, `[bars/box/mdframed]` not used (style file used: thmmarginbreak.sty) (footnote (1)):

2.4.1.2.1 **Rolle's Theorem.**
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *and such that* $f(a) = f(b)$.
Then there exists $c \in]a,b[$ *such that* $f'(c) = 0$.
Command: \newmytheoremw{theoreme}[marginbreak]{}{thwmb}{}

25 `[style]`=default `(change)`, `[bars/box/mdframed]`=`[box]` (style file used: thmchange.sty):

2.4.1.2.1 **Rolle's Theorem.** *Let f a continuous function on a segment* $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *and such that* $f(a) = f(b)$.
Then there exists $c \in]a,b[$ *such that* $f'(c) = 0$.
Command: \newmytheoremw{theoreme}{}[box]{thwcbox}{}

26 `[style]`=changebreak, `[bars/box/mdframed]`=`[box]` (style file used: thmchangebreakbox.sty) (footnote (1), see also section 3.3.5):

2.4.1.2.1 **Rolle's Theorem.**
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *and such that* $f(a) = f(b)$.
Then there exists $c \in]a,b[$ *such that* $f'(c) = 0$.
Command: \newmytheoremw{theoreme}[changebreak]{}[box]{thwcbbox}{}

27 `[style]`=default `(change)`, `[bars/box/mdframed]`=`[mdframed]` (*use with circumspection*!) (style file used: thmchange-.sty):

2.4.1.2.1 **Rolle's Theorem.** *Let f a continuous function on a segment* $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *and such that* $f(a) = f(b)$.
Then there exists $c \in]a,b[$ *such that* $f'(c) = 0$.

> *Command:* *\newmytheoremw{theoreme}{}[mdframed]{thwcmdf}{}*

28 [style]=changebreak, [bars/box/mdframed]=[mdframed] (*use with circumspection*!) (style file used: thmchange-breakmdf.sty) (footnote (1), see also section 3.3.5):

> **2.4.1.2.1   Rolle's Theorem.**
> *Let f a continuous function on a segment* $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *and such that* $f(a) = f(b)$.
>   *Then there exists* $c \in]a,b[$ *such that* $f'(c) = 0$.
>   *Command:* *\newmytheoremw{theoreme}[changebreak]{}[mdframed]{thwcbmdf}{}*

29 [style]=margin, [bars/box/mdframed]=[box] (style file used: thmmargin.sty):

2.4.1.2.1   **Rolle's Theorem.** *Let f a continuous function on a segment* $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *and such that* $f(a) = f(b)$.
   Then there exists $c \in]a,b[$ *such that* $f'(c) = 0$.
   Command: *\newmytheoremw{theoreme}[margin]{}[box]{thwmbox}{}*

30 [style]=marginbbreak, [bars/box/mdframed]=[box] (style file used: thmmarginbreakbox.sty) (footnote (1), see also section 3.3.5):

2.4.1.2.1   **Rolle's Theorem.**
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *and such that* $f(a) = f(b)$.
   Then there exists $c \in]a,b[$ *such that* $f'(c) = 0$.
   Command: *\newmytheoremw{theoreme}[marginbreak]{}[box]{thwmbbox}{}*

31 [style]=marginbbreak, [bars/box/mdframed]=[box] (style file used: thmmarginbreakmdf.sty) (footnote (1), see also section 3.3.5):

2.4.1.2.1   **Rolle's Theorem.**
> *Let f a continuous function on a segment* $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *and such that* $f(a) = f(b)$.
>   *Then there exists* $c \in]a,b[$ *such that* $f'(c) = 0$.
>   *Command:* *\newmytheoremw{theoreme}[marginbreak]{}[mdframed]{thwmbmdf}{}*

2.4.1.3   **Predefined Type with option** [box]=[b]

> Two [style] available: change (default) and margin. Three styles [bars/box/mdframed] available onebar, twobar and box (mdframed ne cannot be used because of possible jump page between the label and the body).

Advanced Personalizations see: section 3.2.2.2
   The name of the counter by default of these theorems is the one of the theorem. Here all counters are put on the counter of sub-sub-sub-sections with the command \numberwithin{*name of theorem*}{paragraph}.

32 [style]=default (change), [bars/box/mdframed]=not used (style file used: thmchangebreak.sty):

2.4.1.3.1   **Rolle's Theorem.**
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ *differnetiable on the open interval* $]a,b[$ *and such that* $f(a) = f(b)$.
   Then there exists $c \in]a,b[$ *such that* $f'(c) = 0$.
   Command: *\newmytheoremw[b]{theoreme}{}{thwbc}{}*

33 [style]=default (change), [bars/box/mdframed]=[onebar] (style file used: thmchangebreak.sty):

2.4.1.3.1 Rolle's Theorem.

> *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
> *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
> *Command:* \newmytheoremw[b]{theoreme}{}[onebar]{thwbconebar}{}

34 `[style]=default (change)`, `[bars/box/mdframed]=[twobar]` (style file used: thmchangebreak.sty):

2.4.1.3.1 Rolle's Theorem.

> *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
> *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
> *Command:* \newmytheoremw[b]{theoreme}{}[twobar]{thwbconebar}{}

35 `[style]=default (change)`, `[bars/box/mdframed]=[box]` (style file used: thmchangebox.sty):

> [2.4.1.3.1   **Rolle's Theorem.**]
>
> *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
> *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
> *Command:* \newmytheoremw[b]{theoreme}{}[box]{thwbconebar}{}

36 `[style]=margin`, `[bars/box/mdframed]=not used` (style file utilisé: thmmarginbreak.sty):

2.4.1.3.1 Rolle's Theorem.

Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheoremw[b]{theoreme}[margin]{}{thwbm}{}

37 `[style]=margin`, `[bars/box/mdframed]=[onebar]` (style file used: thmmarginbreak.sty):

2.4.1.3.1 Rolle's Theorem.

> *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
> *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
> *Command:* \newmytheoremw[b]{theoreme}[margin]{}[onebar]{thwbm}{}

38 `[style]=margin`, `[bars/box/mdframed]=[twobar]` (style file used: thmmarginbreak.sty):

2.4.1.3.1 Rolle's Theorem.

> *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
> *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
> *Command:* \newmytheoremw[b]{theoreme}[margin]{}[twobar]{thwbm}{}

39 `[style]=margin`, `[bars/box/mdframed]=[box]` (style file used: thmmarginbox.sty):

[2.4.1.3.1]   [**Rolle's Theorem.**]

> *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
> *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
> *Command:* \newmytheoremw[b]{theoreme}[margin]{}[box]{thwbm}{}

Without optional argument:

[2.4.1.3.2]   *Let f a continuous function on un segment $[a,b] \subset \mathbb{R}$ dérivable sur l'intervalle $]a,b[$ and such that $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: \newmytheoremw[b]{theoreme}[margin]{}[box]{thwbm}{}

2.4.2 Theorems unnumbered without label

2.4.2.1 Type by default (i.e. `{type}={}`)

> Two `[style]` available: `plain` (default) and `break`. Styles `[bars/box/mdframed]` not useful.

Advanced Personalizations see: section 3.2.1

40 `[style]`=default (`plain`) (style file used: mythslnnp.sty):

Rolle's Theorem. *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: *\newmytheoremwn{}{}{thwndefp}{}*

41 `[style]`=break (style file used: mythslnnb.sty) (footnote (1)):

Rolle's Theorem.
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: *\newmytheoremwn{}[break]{}{thwndefb}{}*

2.4.2.2 Predefined Type without option `[box]`

> Two `[style]` available: `plain` (default) and `break`. Two styles `[bars/box/mdframed]` available `box` and `mdframed` (the other give nothing).

Advanced Personalizations see: section 3.2.2.1

42 `[style]`=default (`plain`), `[bars/box/mdframed]`=non utilisé (style file utilisé: thmslnnplain.sty):

Rolle's Theorem. *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ et telle que $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: *\newmytheoremwn{theoreme}{}{thwn}{}*

43 `[style]`=default (`plain`), `[bars/box/mdframed]`=`[box]` (style file used: thmslnnplain.sty):

Rolle's Theorem. *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: *\newmytheoremwn{theoreme}{}[box]{thwnbox}{}*

44 `[style]`=default (`plain`), `[bars/box/mdframed]`=`[mdframed]` (*use with circumspection*!) (style file used: thmslnnplain-.sty):

Rolle's Theorem. *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: *\newmytheoremwn{theoreme}{}[mdframed]{thwnmdf}{}*

45 `[style]`=break, `[bars/box/mdframed]`=not used (style file utilisé: thmslnnbreak.sty) (footnote (1)):

Rolle's Theorem.
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.
Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
Command: *\newmytheoremwn{theoreme}[break]{}{thwn}{}*

46 `[style]`=break, `[bars/box/mdframed]`=`[box]` (style file used: thmslnnbreakbox.sty) (footnote (1), see also section 3.3.5-):

> **Rolle's Theorem.**
>
> *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
>   *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
>   *Command:* \newmytheoremwn{theoreme}[break]{}{box}{thwnbrbox}{}

47 `[style]=break`, `[bars/box/mdframed]=[mdframed]` (style file used: thmslnnbreakmdf.sty) (footnote (1), see also section 3.3.5):

> **Rolle's Theorem.**
>
> *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
>   *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
>   *Command:* \newmytheoremwn{theoreme}[break]{}[mdframed]{thwnbrmdf}{}

2.4.2.3 Predefined Type with option `[box]=[b]`

> The option `[style]` is deactivated. Three styles `[bars/box/mdframed]` available: `onebar`, `twobar` and `box` (`mdframed` cannot be used because of possible jump page between the label and the body).

Advanced Personalizations see: section 3.2.2.2

48 `[bars/box/mdframed]=`not used (style file utilisé: thmslnnbreak.sty):

Rolle's Theorem.
Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.
  Then there exists $c \in]a,b[$ such that $f'(c) = 0$.
  Command: \newmytheoremwn[b]{theoreme}{}{thwnb}{}

49 `[bars/box/mdframed]=onebar` (style file used: thmslnnbreak.sty):

Rolle's Theorem.
| *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
| *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
| *Command:* \newmytheoremwn[b]{theoreme}{}[onebar]{thwnbonebar}{}

50 `[bars/box/mdframed]=twobar` (style file used: thmslnnbreak.sty):

Rolle's Theorem.
‖ *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
‖   *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
‖   *Command:* \newmytheoremwn[b]{theoreme}{}[twobar]{thwnbtwobar}{}

51 `[bars/box/mdframed]=box` (style file used: thmslnnbox.sty):

> **Rolle's Theorem.**
>
> *Let f a continuous function on a segment $[a,b] \subset \mathbb{R}$ differnetiable on the open interval $]a,b[$ and such that $f(a) = f(b)$.*
>   *Then there exists $c \in]a,b[$ such that $f'(c) = 0$.*
>   *Command:* \newmytheoremwn[b]{theoreme}{}[box]{thwnbbox}{}

3 Advanced Personalizations of environments

Each type has some style files associated:

The type by default has 10 qtyle files associated:

mythb.sty	mythcb.sty	mythc.sty	mythmb.sty	mythm.sty
mythnnb.sty	mythnnp.sty	mythp.sty	mythslnnb.sty	mythslnnp.sty

Each predefined type has 23 style files associated:

typbox.sty	typmarginbreakbox.sty	typnnplain.sty
typbreak.sty	typmarginbreakmdf.sty	typplain.sty
typchangebox.sty	typmarginbreak.sty	typslnnbox.sty
typchangebreakbox.sty	typmargin.sty	typslnnbreakbox.sty
typchangebreakmdf.sty	typmdf.sty	typslnnbreakmdf.sty
typchangebreak.sty	typnnbox.sty	typslnnbreak.sty
typchange.sty	typnnbreak.sty	typslnnplain.sty
typmarginbox.sty	typnnmdf.sty	

where typ is:

thm for theoreme	cor for corollaire
prop for proposition	lem for lemme
def for definition	not for notation
rem for remarque	exe for exercice
exem for exemple	con for conjecture

These files are used to construct the head of the theorem and to put the body relatively to it. We describe below the internal commands used for this for each style file. All these commands can be redefined, either in the LaTeX preamble or in the document, writing \def\command{*choice*} where *choice* is a command which takes generally an argument (except for the commands \ATHMxxx and \FTHMxxx).

In all these commands ##1 is the label, ##2 is the counter and ##3 is the optionnal argument of the theorem.

3.1 Theorems with label

3.1.1 Type by default (i.e. {type}={})

Théorèmes numbered: six style files used: mythp.sty, mythb.sty, mythc.sty, mythcb.sty, mythm.sty, mythmb.sty
Theorems not numbered: two style files used: mythnnp.sty, mythnnb.sty

☛ **Theorems numbered**:

- **Without optionnal argument**:
  \BTHM*style*{\theoremheaderfont{##1}\ {\Ntheoremheaderfont{##2}}\FTHM*style*
- **With optionnal argument**:
  \BTHM*style*{\theoremheaderfont{##1}\ {\Ntheoremheaderfont{##2}}\STHM*style*{\normalfont\normalsize ##3}\FTHMopt*style*

☛ **Théorèmes not numbered**:

- **Without optionnal argument**:
  \BTHM*style*{\theoremheaderfont{##1}\FTHM*style*
- **With optionnal argument**:
  \BTHM*style*{\theoremheaderfont{##1}\STHM*style*{\normalfont\normalsize ##3}\FTHMopt*style*

where *style* is the choice made in option {style} of the définition of the environment.
The default choices of these commands are:
    \BTHMplain=\BTHMbreak=\BTHMmargin=\BTHMmarginbreak=\hspace*{\parindent}, \BTHMchange=\BTHMchangebreak={}
    \FTHMplain=\FTHMbreak={.}, \FTHMoptplain=\FTHMoptbreak={).}
    \STHMplain=\STHMbreak={\ (}, \STHMchangebreak=\hspace*{\parindent}

3.1.2 Predefined Types

3.1.2.1 Without option [box]
    Theorems numbered: Four style files used: `typplain.sty`, `typbreak.sty`, `typbox.sty` and `typmdf.sty`.
    Theorems not numbered: Four style files used: `typnnplain.sty`, `typnnbreak.sty`, `typnnbox.sty` and `typnnmdf.sty`.

☛ **For** `typplain.sty` **and** `typbreak.sty`:

  • **Without optionnal argument**:
    `\BTHM`*type**style*`{\`*type*`font{##1}\ {\N`*type*`font{##2}}\FTHM`*style*
  • **With optionnal argument**:
    `\BTHM`*type**style*`{\`*type*`font{##1}\ {\N`*type*`font{##2}}\STHM`*style*`{\normalfont\normalsize ##3}\FTHMopt`*style*

☛ **For:** `typnnplain.sty` **and** `typnnbreak.sty`:

  • **Without optionnal argument**:
    `\BTHM`*type**style*`{\`*type*`font{##1}\FTHM`*style*

  • **With optionnal argument**:
    `\BTHM`*type**style*`{\`*type*`font{##1}\STHM`*style*`{\normalfont\normalsize ##3}\FTHMopt`*style*

☛ **For** `typbox.sty` **and** `typmdf.sty`:

  • **Without optionnal argument**:
    `{\BTHM`*type*`box{\`*type*`font{##1}\ {\N`*type*`font{##2}}\FTHMbreak}\ATHM`*type*`box
    and
    `\BTHM`*type*`mdf{\`*type*`font{##1}\ {\N`*type*`font{##2}}\FTHMbreak
  • **With optionnal argument**:
    `{\BTHM`*type*`box{\`*type*`font{##1}\ {\N`*type*`font{##2}}\STHMbreak{\normalfont\normalsize ##3}\FTHMoptbreak}\ATHM`*ty-*
    pe`box
    and
    `\BTHM`*type*`mdf{\`*type*`font{##1}\ {\N`*type*`font{##2}}\STHMbreak{\normalfont\normalsize ##3}\FTHMoptbreak

☛ **For** `typnnbox.sty` **et** `typnnmdf.sty`:

  • **Without optionnal argument**:
    `\BTHM`*type*`box{\`*type*`font{##1}\FTHMbreak}\ATHM`*type*`box
    and
    `\BTHM`*type*`mdf{\`*type*`font{##1}\FTHMbreak

  • **With optionnal argument**:
    `{\BTHM`*type*`box{\`*type*`font{##1}\STHMbreak{\normalfont\normalsize ##3}\FTHMoptbreak}\ATHM`*t-*
    ype`box
    and
    `\BTHM`*type*`mdf{\`*type*`font{##1}\STHMbreak{\normalfont\normalsize ##3}\FTHMoptbreak

☛ **defaults**: `\BTHM`*type*`plain=\BTHM`*type*`break=\hspace*{\parindent}`, `\BTHM`*type*`box=\BTHM`*type*`mdf=\hsp-`
  `ace*{\parindent}\formatbfl`*type*`, \FTHMplain=\FTHMbreak={.}, \STHMplain=\STHMbreak={\ (}, \FTH-`
  `Moptplain=\FTHMoptbreak=).}`, where
  `\formatbfl`*type*`=\tcbox[tcbox raise base,top=0pt,left=0pt,right=0pt,bottom=0pt,colback=cbl`*type*`,boxrule=\crl`*type*`,colframe=cfl`*type*`]`
  with `cbl`*type*`=`color RGB 255,255,250, `crl`*type*`=0.5pt`, `cfl`*type*`=`color RGB 0,0,0, `\ATHM`*type*`box={}`

3.1.2.2 With option [box]=[b]
Two style files used for numbered theorems: `typbreak.sty`, `typbox.sty`, and, for unnumbered: `typnnbreak.sty`, `typnnbox.sty`, with default commands described above.

3.2 Theorems without label

3.2.1 Type by default (i.e. {type}={})

Theorems numbered: Four style files used: `mythc.sty`, `mythcb.sty`, `mythm.sty`, `mythmb.sty`. The commands of these files are described section .
Theorems not numbered: two style files used: `mythslnnp.sty` and `mythslnnb.sty`:

☛ **Without optionnal argument**:
  `\BTHM`*style*

☛ **With optionnal argument**:
  `\BTHM`*style*`{\theoremheaderfont{##3}`

☛ **default**: `\BTHMplain=\BTHMbreak=\hspace*{\parindent}`

3.2.2 Predefined Types

3.2.2.1 Without option [box]

Theorems numbered: eight style files used: `typchange.sty`, `typchangebreak.sty`, `typmargin.sty`, `typmarginbreak.sty`, `typchangebreakbox.sty`, `typchangebreakmdf.sty`, `typmarginbreakbox.sty`, `thmmarginbreakmdf.sty`

Theorems not numbered: four style files used: `typslnnplain.sty`, `typslnnbreak.sty`, `typslnnbreakbox.sty`, `typslnnbreakmdf.sty`

☛ **Theorems numbered**:

- **Without optionnal argument**:
  `typchange.sty: \BTHM`*type*`change{\N`*type*`font{##2}}\FTHMchange`
  `typchangebreak.sty: \BTHM`*type*`changebreak{\N`*type*`font{##2}}`
  `typmargin.sty: \N`*type*`font{##2}}\hskip\labelsep \BTHM`*type*`margin`
  `typmarginbreak.sty:  \N`*type*`font{##2}}\hskip\labelsep\vspace*{-\baselineskip}`
  `typchangebreakbox.sty:{\BTHM`*type*`changebreakbox{\N`*type*`font{##2}}}\ATHM`*type*`changebreakbox`
  `typchangebreakmdf.sty:  \BTHM`*type*`changebreakmdf{\N`*type*`font{##2}}`
  `typmarginbreakbox.sty:`
  `\BTHM`*type*`marginbreakbox{\N`*type*`font{##2}}}\hskip\labelsep\vspace*{-\baselineskip}`
  `thmmarginbreakmdf.sty:`
  `\BTHM`*type*`marginbreak`*boite*`{\N`*type*`font{##2}}}\hskip\labelsep\vspace*{-\baselineskip}`

- **With optionnal argument**:
  `typchange.sty: \BTHM`*type*`change{\N`*type*`font{##2}\STHMchange{\normalfont\normalsize\`*type*`font{##3}}`
  `typchangebreak.sty: \BTHM`*type*`changebreak{\N`*type*`font{##2}\STHMchangebreak{\normalfont\normalsiz-`
  `e\`*type*`font{##3}}`
  `typmargin.sty: {\N`*type*`font{##2}}\hskip\labelsep \BTHM`*type*`margin{\normalfont\normalsize\typefont-`
  `{##3}}`
  `typmarginbreak.sty:  {\N`*type*`font{##2}}\hskip\labelsep \BTHM`*type*`marginbreak{\normalfont\normalsi-`
  `ze\`*type*`font{##3}}`
  `typchangebreakbox.sty:`
  `{\BTHM`*type*`changebreakbox{\N`*type*`font{##2}\STHMchangebreak{\normalfont\normalsize\`*type*`font{##3}}}}\ATHM`*type*`ch-`
  `angebreakbox`
  `typchangebreakmdf.sty:`
  `\BTHM`*type*`changebreakmdf{\N`*type*`font{##2}\STHMchangebreak{\normalfont\normalsize\`*type*`font{##3}}}`
  `typmarginbreakbox.sty:`
  `{\BTHM`*type*`marginbreakbox{\N`*type*`font{##2}}}\hskip\labelsep \BTHM`*type*`marginbreakbox{\normalfont\normalsize\ty-`
  `pe`font{##3}}}\ATHM`*type*`marginbreakbox`
  `typmarginbreakmdf.sty:`
  `\BTHM`*type*`marginbreakmdf{\N`*type*`font{##2}}}\hskip\labelsep \BTHM`*type*`marginbreakmdf{\normalfont\normalsize\typ-`
  `e`font{##3}}`

- **defaults**: `\BTHM`*type*`change=\BTHM`*type*`changebreak={}`, `\BTHM`*type*`margin=\hspace*{\parindent}`, `\-`
  `BTHM`*type*`changebreak`*boite*`=\BTHM`*type*`marginbreak`*boite*`=\hspace*{\parindent}\formatbfl`*type* `-`
  (see section 3.1.2.1), `\FTHMchange={\hspace*{\parindent}}`, `\STHMchange=\STHMchangebreak=\hspa-`
  `ce*{\parindent}`, `\ATHM`*type*`changebreakbox=\ATHM`*type*`marginbreakbox={}`

☛ **Theorems not numbered**:

- **Without optionnal argument**:
  `typslnnplain.sty=typslnnbreak.sty: \BTHM`*type**style*

- **With optionnal argument**:
  `typslnnplain.sty=typslnnbreak.sty: \BTHM`*type**style*`{\`*type*`font{##3}}`
  `typslnnbreakbox.sty: \BTHM`*type*`breakbox{\`*type*`font{##3}}\ATHM`*type*`breakbox`
  `typslnnbreakmdf.sty: \BTHM`*type*`breakmdf{\`*type*`font{##3}}`

- **defaults**: `\BTHM`*type*`plain=\BTHM`*type*`break=\hspace*{\parindent}`, `\BTHM`*type*`breakbox=\BTHM`*typ-*
  `e`breakmdf=\hspace*{\parindent}\formatbf l`*ype* (see section 3.1.2.1), `\ATHM`*type*`breakbox={}`,

3.2.2.2 With option [box]=[b]

Theorems numbered: four style files used: `typchangebreak.sty`, `typchangebox.sty`, `typmarginbreak.sty`, `typmarginbox.`
Theorems not numbered: two style files used: `typslnnbreak.sty`, `typslnnbox.sty`

☛ **Theorems numbered**:

- **Without optionnal argument**:
  `typchangebreak.sty: \BTHM`*type*`changebreak{\N`*type*`font{##2}}`
  `typchangebox.sty: \BTHM`*type*`changebox{\N`*type*`font{##2}}\ATHMtypechangebox`

typmarginbreak.sty: `\Ntypefont{##2}}`
typmarginbox.sty: `\BTHMtypemarginbox{\Ntypefont{##2}}`

- **With optionnal argument**:
  typchangebreak.sty: `\BTHMtypechangebreak{\Ntypefont{##2}\STHMchangebreak{\normalfont\normalsize\typefont{##3}}}`
  typchangebox.sty: `\BTHMtypechangebox{\Ntypefont{##2}\STHMchangebreak{\normalfont\normalsize\typefont{##3}}}\ATHMtypechangebox`
  typmarginbreak.sty: `\Ntypefont{##2}}\hskip\labelsep \BTHMtypemarginbreak{\normalfont\normalsize\typefont{##3}}`
  typmarginbox.sty: `\BTHMtypemarginbox{\Ntypefont{##2}}}\hskip\labelsep \BTHMtypemarginbox{\normalfont\normalsize\typefont{##3}}}\ATHMtypemarginbox`

- **defaults**: `\BTHMtypechangebreak={}`, `\BTHMtypechangebox=\BTHMtypemarginbox=\hspace*{\parindent}\formatbfltype` (see section 3.1.2.1), `\ATHMtypechangebox=\ATHMtypemarginbox={}`, `\STHMchagebreak=\BTHMtypemarginbreak=\hspace*{\parindent}`

☛ **Theorems not numbered**:

- **Without optionnal argument**:
  typslnnbreak.sty: `\BTHMtypesbreak`

- **With optionnal argument**:
  typslnnbreak.sty: `\BTHMtypebreak{\typefont{##3}}`
  typslnnbox.sty: `\BTHMtypebox{\typefont{##3}}\ATHMtypebox`

- **defaults**: `\BTHMtypesbreak=\hspace*{\parindent}`, `BTHMtypebox=\hspace*{\parindent}\formatbfltype` (see section 3.1.2.1), `\ATHMtypebox={}`

3.3 Examples of advanced personalizations

3.3.1 Remark on theorems of `amsthm`

To obtain theorems of style change similar to the ones obtained with `amsthm.sty`, it suffice to use a theorem without label and use the optional argument as the label writing `[\hspace*{-\parindent}\ Theorem.]` for the optional argument of theorems. For example:

1 Theorem. *A style similar to style "change" of `amsthm.sty`. Defined by the command*

$$\newmytheoremw{theoreme}{}{thmw}{}$$

1 Theorem.
A style similar to style "change" of `amsthm.sty` with option [b]. Defined by the command

$$\newmytheoremw[b]{theoreme}{}{thmwb}{}$$

3.3.2 Fonts and colors

The choices of fonts and colors for the body of the theorem has been explained at Simple Personalization, with, for the body, restrictions for color with option `[box]`. These commands apply also to the fonts and colors of the label.

Here is an example with use of counters and last argument:

PROPOSITION 3.1 (Optional Argument of theorems).
This environment has been created with the command

$$\newmytheorem[b]{proposition}{}[onebar]{prop}[SP]{Proposition}[0.1\baselineskip]$$

the counter SP has been defined beforehand by the command

$$\newcounter{SP}[section]\ \def\theSP{\thesection.\@arabic\c@SP}$$

The last argument has been used to separate correctly the body from the label, this one using a special font. The commands used to change the font of the label and the number are respectively `\def\propositionfont{...}` and `\def\Npropositionfont{...}`. Here we use the commands

Note that the use of the command \def\propositionfont{...} change exactly the font of the label (braces around optional argument and final point included, but not the one of the number neither of the optional argument of theorems), but if a color command is added, it applies to all the label, optional argument of theorems included, which is not the case of the command \def\Npropositionfont{...}.

An example not numbered without label:

AN OTHER EXAMPLE WITH THE TYPE PROPOSITION.

This environment has been defined with the command

\newmytheoremwn[b]{proposition}{}[twobar]{propwn}

It takes the preceding configuration of type " proposition" , the optional argument is considered as the label, and, font and color of the label of the type "proposition" are automatically applied.
Similarly the color of the vertical bars (defined in the LATEX preamble) is the color defined at the first use of type " proposition".

An example of the use of a font command for the body using a tfm file (c.f. command \myfont[a]):

Font of the Body.

This environment has been defined with the command

\newmytheoremn[b]{conjecture}{}[box]{conjpol}{\Large Font of the Body}

Before the use of this environment a font command has been defined with

\newfont\calligra{callig15.tfm scaled 1600}

Then \calligra has been written at the beginning of the text of the body which put all the text of the body in the font "Calligra".
It is also possible to define the font in the LATEX preamble writing \calligra in the second obligatory argument of the definition of the environment.

Remark: in the definition above, it has been added "\Large " for the label: this affect the label but not the whole head, the point being still in the standard size.

3.3.3 Putting of the head with options [b]+[box] or [b]+[margin]+[box] or {break}+[box] or {changebreak}+-[box] or {marginbreak}+[box] or {break}+[mdframed] or {changebreak}+[mdframed] or {marginbreak]-+[mdframed]

With these options the body is below the label which is in a box (tcbox). By default, this box is on the left with an indentation of \parindent. Redefining the commands BTHMxxx et ATHMxxx corresponding to these environments, allows to put the head not only to a choosen distance of the margin, but also:

☞ with [b]+[box] (16, 35) or [b]+[margin]+[box] (39) or {break}+[box] (11) or {changebreak}+[box] (26) or {marginbreak}+[box] (30): either at the center or at the right

☞ with {break}+[mdframed] (12) or {changebreak}+[mdframed] (28) or {marginbreak}+[mdframed] (30): at the center

Here are some examples.

With the type proposition whose label font has been modified before and the option [b] and [box], the head centered:

$$\mathscr{P}\text{ROPOSITION } \mathscr{3}.\mathscr{2} \text{ (Centering the Head).}$$

> *This environment has been dfined with the command*
>
> $$\textit{\textbackslash newmytheorem[b]\{proposition\}\{\}[box]\{propbox\}[SP]\{Proposition\}}$$
>
> *then the corresponding commands* \textit{\textbackslash BTHMxxx and ATHMxxx} *has been redefined with*
> *\textbackslash def\textbackslash BTHMpropositionbox\{\textbackslash hfill\textbackslash formatbflproposition\} and \textbackslash def\textbackslash ATHMpropositionbox\{\textbackslash hfill\}*
> *to center the head.*

With the type lemme, without option [b] the style marginbreak (thus the command is \newmytheoremw and the label remplaced by the optional argument of theorems) and option [box], the head on the right:

1 | **HEAD ON THE RIGHT.**

> *This environment has been defined with the command*
>
> $$\textit{\textbackslash newmytheoremw\{lemme\}[marginbreak]\{\}[box]\{lemmbb\}\{\}\{\}}$$
>
> *then the corresponding commands* \textit{\textbackslash BTHMxxx} *has been redefined with*
> *\textbackslash def\textbackslash BTHMlemmemarginbreakbox\{\textbackslash hfill\textbackslash formatbfllemme\}*
> *to obtain the head on the right, and the fonts of the head has been modified with the commands*
> *\textbackslash def\textbackslash lemmefont\{\textbackslash red\textbackslash huge\textbackslash bfseries\textbackslash scshape\}*
> *\textbackslash def\textbackslash Nlemmefont\{\textbackslash green\textbackslash huge\textbackslash bfseries\textbackslash itshape\}.*

With the type definition, and options [break] and [mdframed] the head centered:

> **Definition 1.**
>
> This environment has been defined with the command
>
> \newmytheorem{definition}[break]{}[mdframed]{defbmdf}{Definition}
>
> after the corresponding commands BTHMxxx has been redefined with
>
> \def\BTHMdefinitionmdf{\hfill\formatbfldefinition}
>
> to have the head centered.

3.3.4 Other examples

> **THEOREM 1** (*use of several advanced parameters*).
>
> *This environment has been defined with the command*
>
> $$\textit{\textbackslash newmytheorem[b]\{theoreme\}\{\}[box]\{thmbox\}\{Theorem\}}$$
>
> *Before this theorem the following commands has been modified:*
> *\textbackslash definecolor\{colortheoremebox\}\{RGB\}\{213,252,249\} (color of the background of the box of the body: redefine the color colortheoremebox with xcolor)*
> *\textbackslash definecolor\{mypurple\}\{RGB\}\{137,0,86\} (definition of the color of the background of the box of the head with xcolor)*
> *\textbackslash newrgbcolor\{mypurple\}\{.537 .000 .337\} (dfinition of the color for the text of the body and the head: with pstricks)*
> *\textbackslash def\textbackslash BTHMtheoremebox\{\textbackslash hfill\textbackslash fcolorbox\{mypurple\}\{colortheoremebox\}\}*
> *\textbackslash def\textbackslash ATHMtheoremebox\{\textbackslash hfill\} (format of the head: box with border, of background color colortheoremebox and border color mypurple centered)*
> *\textbackslash def\textbackslash theoremefont\{\textbackslash mypurple\textbackslash large\textbackslash bfseries\textbackslash scshape\} (font of the head colored by \textbackslash mypurple)*
> *\textbackslash setlength\{\textbackslash fboxrule\}\{1.5pt\} (size of the border of the box of the head)*
> *\textbackslash def\textbackslash bordertheoremebox\{1.5pt\} (size of the border of the box of the body)*

`\def\colortheoremeboxtext{\mypurple}` *(color of the text of the body and of the border of the box of the body:* `\mypurple`*)*

Use of multicolumns in the body of the theorem:

THEOREM 1.

> *Before the multicolumn it has been written* `\vspace*{-2\multicolsep` *and after* `\vspace*{-\multicolsep}` *to avoid the vertical separations before and after.*
>
> *some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicol-*
>
> *umn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn...*

THEOREM 2 (use of multicolumn)**.**

> *Before the multicolumn it has been written* `\vspace*{-2\baselineskip}` *to avoid the vertical separations before and after.*
>
> *some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in mul-*
>
> *ticolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn... some text in multicolumn...*

Put a box (of `boites_exemples.sty` or `mytheorem.sty`) in the body of the theorem, even if this does not produce a compilation error, may produce non aesthetics results! For example:

With the preceding example, if a part of the body is put in a colored box (of `mytheorem.sty`) without changing anything it gives:

THEOREM 3 (*use of certain parameters*)**.**

Before this theorem the following commands have been changed:

> `\definecolor{colortheoremebox}{RGB}{213,252,249}` *(color of the background of the box of the body: redefine the color* `colortheoremebox` *with* `xcolor`*)*
>
> `\definecolor{mypurple}{RGB}{137,0,86}` *(definition of the color of the background of the box of the head with* `xcolor`*)*
>
> `\newrgbcolor{mypurple}{.537 .000 .337}` *(dfinition of the color for the text of the body and the head: with* `pstricks`*)*
>
> `\def\BTHMtheoremebox{\hfill\fcolorbox{mypurple}{colortheoremebox}}`
> `\def\ATHMtheoremebox{\hfill}` *(format of the head: box with border, of background color* `colortheoremebox` *and border color* `mypurple` *centered)*
>
> `\def\theoremefont{\mypurple\large\bfseries\scshape}` *(font of the head colored by* `\mypurple`*)*
>
> `\setlength{\fboxrule}{1.5pt}` *(size of the border of the box of the head)*
>
> `\def\bordertheoremebox{1.5pt}` *(size of the border of the box of the body)*
>
> `\def\colortheoremeboxtext{\mypurple}` *(color of the text of the body and of the border of the box of the body:* `\mypurple`*)*

With a colored box in the body with commands:
`\definecolor{boxinside}{RGB}{255,255,235}`
`\begin{boitetheorembox}{boxinside}{\black}{1pt}{\parindent}`
part of the body in a colored box of background color `boxinside` *and text color* `\black`
`\end{boitetheorembox}`

Nevertheless, deleting the border of the body of the theorem gives a result which can be useful:

THEOREM 4 (*use of certain parameters*)**.**

Before this theorem the following commands have been changed:

> `\definecolor{colortheoremebox}{RGB}{213,252,249}` *(color of the background of the box of the body: redefine the color* `colortheoremebox` *with* `xcolor`*)*
>
> `\definecolor{mypurple}{RGB}{137,0,86}` *(definition of the color of the background of the box of the head with* `xcolor`*)*

\newrgbcolor{mypurple}{.537 .000 .337} *(dfinition of the color for the text of the body and the head: with* pstricks*)*
    \def\BTHMtheoremebox{\hfill\fcolorbox{mypurple}{colortheoremebox}}
 \def\ATHMtheoremebox{\hfill} *(format of the head: box with border, of background color* colortheoremebox *and border color* mypurple *centered)*
    \def\theoremefont{\mypurple\large\bfseries\scshape} *(font of the head colored by* \mypurple*)*
    \setlength{\fboxrule}{1.5pt} *(size of the border of the box of the head)*
    \def\bordertheoremebox{1.5pt} *(size of the border of the box of the body)*
    \def\colortheoremeboxtext{\mypurple} *(color of the text of the body and of the border of the box of the body:* \mypurple*)*

With a colored box in the body after deleting the border of the box of the body with the commands:
\def\bordertheoremebox{0pt}
\definecolor{boxinside}{RGB}{255,255,235}
\begin{boitetheorembox}{boxinside}{\black}{1pt}{\parindent}
part of the body in a colored box of background color boxinside *and text color* \black
\end{boitetheorembox}

Exactly the same statement but with an environment defined with option [barres/box]=[twobar] colouring bars and text with \mypurple (with commands \def\colortheoremebreakbar{\mypurple} \def\colorbodytheoremeboite{\mypurple}):

THEOREM 2.

Before this theorem the following commands have been changed:

   \definecolor{colortheoremebox}{RGB}{213,252,249} *(color of the background of the box of the body: redefine the color* colortheoremebox *with xcolor)*
    \definecolor{mypurple}{RGB}{137,0,86} *(definition of the color of the background of the box of the head with xcolor)*
    \newrgbcolor{mypurple}{.537 .000 .337} *(dfinition of the color for the text of the body and the head: with* pstricks*)*
    \def\BTHMtheoremebox{\hfill\fcolorbox{mypurple}{colortheoremebox}}
 \def\ATHMtheoremebox{\hfill} *(format of the head: box with border, of background color* colortheoremebox *and border color* mypurple *centered)*
    \def\theoremefont{\mypurple\large\bfseries\scshape} *(font of the head colored by* \mypurple*)*
    \setlength{\fboxrule}{1.5pt} *(size of the border of the box of the head)*
    \def\bordertheoremebox{1.5pt} *(size of the border of the box of the body)*
    \def\colortheoremeboxtext{\mypurple} *(color of the text of the body and of the border of the box of the body:* \mypurple*)*

With a colored box in the body with the commands:
\definecolor{boxinside}{RGB}{255,255,235}
\begin{boitetheorembox}{boxinside}{\black}{1pt}{\parindent}
part of the body in a colored box of background color boxinside *and text color* \black
\end{boitetheorembox}

Exactly the same but, instead of a coloured box in the body, a box with two bars at the left and an indentation of this last box of \parindent and with text color green, the text color of the body being the default with \def\colorbodytheoremeboite{\black}:

THEOREM 3.

Before this theorem the following commands have been changed:

Code: \definecolor{colortheoremebox}{RGB}{213,252,249} *(color of the background of the box of the body: redefine the color* colortheoremebox *with xcolor)*
    \definecolor{mypurple}{RGB}{137,0,86} *(definition of the color of the background of the box of the head with xcolor)*
    \newrgbcolor{mypurple}{.537 .000 .337} *(dfinition of the color for the text of the body and the head: with* pstricks*)*
    \def\BTHMtheoremebox{\hfill\fcolorbox{mypurple}{colortheoremebox}}
 \def\ATHMtheoremebox{\hfill} *(format of the head: box with border, of background color* colortheoremebox *and border color* mypurple *centered)*
    \def\theoremefont{\mypurple\large\bfseries\scshape} *(font of the head colored by* \mypurple*)*

> > *With a box having two bars at left and an indentation of \parindent with commands:*
> > `\begin{boitetheoremtwobar}{\blue\hspace*{2mm}Code:}{1}{1.5pt}{1.7\parindent}{\red}{\green}`
> > *part of the body in the box having two bars red at its left with indentation of 1.7\parindent and the word "Code" of blue color at the left of the double red bar*
> > `\end{boitetheoremtwobar}`

3.3.5 Limitations incompatibilities and remarks

The package `mytheorem` is **incompatible** with **every** package defining theorems environments like: `amsthm`, `ntheorem` etc...

Under a standard TeX distribution (like TeXLive 2017 ou newer) I don't know limitation apart those concerning the color with option `[box]`. Except these problems which may appear with the use of the command `\colortypeboxtext{\color}`, some attention have to be done with some tools:

☛ Floating objects close or inside theorems may cut them and it is better to not use these objects.

☛ It seems that it is not possible to put a graphic made with PSTricks inside the body of a theorem (at least when it is in a box `[box]`).

☛ ...

The use of the optional argument `[boite]=[b]` instead of `[style]=[break]` (without using the first optional argument) is illustrated below:

Theorem 1.
Formule: $\int_a^b f(t)\,dt = 1.$

The same, but without a box:

Theorem 2.
Formule: $\int_a^b f(t)\,dt = 1.$

In the case of a small formula, or when there is no formula in the first line of the body, both environments give very similar results.

In the configurations where the head is put in a une boite `tcbox` box, without option `[boite]=[b]`, to add vertical space between the head and the body, it is possible to use the option `raise` in these boxes. For example with `[break]` and `[box]`:

> **Conjecture 1.**
> *Formule:* $\int_a^b f(t)\,dt = 1.$ *Before this statement, it has been written:*
> `\def\newformatbflconjecture{\tcbox[tcbox raise=2pt,top=0pt,left=0pt,right=0pt,bottom=0pt,colback=cblconjecture,boxrule=\crlconjecture,colframe=cflconjecture]}`
> `\def\BTHMconjecturebox{\hspace*{\parindent}\newformatbflconjecture}`

Same thing with `[break]` and `[mdframed]`:

> **Conjecture 1.**
> *Formule:* $\int_a^b f(t)\,dt = 1.$ *(avec* `\def\BTHMconjecturemdf{\hspace*{\parindent}\newformatbflconjecture}`*)*

After, the modified commands are put to the default with

`\def\BTHMconjecturebox{\hspace*{\parindent}\formatbflconjecture}`

and

`\def\BTHMconjecturemdf{\hspace*{\parindent}\formatbflconjecture}`

which gives for example:

> **Conjecture 2.**
> *Formule:* $\displaystyle\int_a^b f(t)\,dt = 1.$

4 The environments " proof"

The classical environment " proof" of "amsthm.sty" is present identically in "demonstration.sty" . There is also two other environments for proofs: the environment "Preuve" in which the final square of "proof" environment is replaced by "C.Q.F.D." on an empty line at the end of the environment and the environment "PreuveQED" identical with "Q.E.D." instead of "C.Q.F.D.":

Proof. Environment "proof" classical ended by a square at the end of the last line of the environment. □

Proof. Environment "Preuve" ended by an empty line containing C.Q.F.D. at the right.

<div align="right">C.Q.F.D.</div>

Proof. Environment "PreuveQED" ended by an empty line containing Q.E.D. at the right.

<div align="right">Q.E.D.</div>

5 Environments "box" of mytheorem

Three environments "box" constructed with `boites.sty` (which are adaptations of examples given in `boites_exemples-.sty`) are defined in mytheorem. These are those automatically used to construct the body of theorems environments with option `[boite]=[b]` and option `[barres/box]=[onebar]` or `[twobar]` or `[box]`. These environments can be used directly in a document, this is what have been done in the examples of boxes in a theorem above (the package `boites_exemples.sty` contain also other examples of boxes which can be used loading it). Their definitions are the following (all arguments of each environment must be typed when using them):

- ☛ `boitetheoremonebar`: box with a vertical bar at his left; it is used with the commands:
  `\begin{boitetheoremonebar}{#1}{#2}{#3}{#4}{#5}`
  content of the box
  `\end{boitetheoremonebar}`
  where:

  - #1 can be used to put an object at the left of the first line of the box; it is empty when used for theorems;
  - #2: number fixing the width of the vertical bar at the left in points (in theorems this parameter is fixed by default at 1);
  - #3: left margin of the environment (a valid measure must be typed; in theorems this parameter is fixed by default to `2.3\parindent`);
  - #4: color of the vertical bar defined withe a color command of pstricks (in theorems this parameter is empty by default);
  - #5: color of the text contained in the box typed with a color command of pstricks (in theorems this parameter is empty by default);

- ☛ `boitetheoremtwobar`: box with two vertical bars at his left; it is used with the commands:
  `\begin{boitetheoremtwobar}{#1}{#2}{#3}{#4}{#5}{#6}`
  content of the box
  `\end{boitetheoremtwobar}`
  where:

  - #1 can be used to put an object at the left of the first line of the box; it is empty when used for theorems;
  - #2: number fixing the width of the vertical bars at the left in points (in theorems this parameter is fixed by default at 1);
  - #3: separation between the two vertical bars (a valid measure must be typed; in theorems this parameter is fixed by default to `1.5pt`);
  - #4: left margin of the environment (a valid measure must be typed; in theorems this parameter is fixed by default to `2.3\parindent`);

- #5: color of the vertical bars defined withe a color command of pstricks (in theorems this parameter is empty by default);
- #6: color of the text contained in the box typed with a color command of pstricks (in theorems this parameter is empty by default);

☛ boitetheorembox: box with a colored background and a border; it is used with the commands:
\begin{boitetheorembox}{#1}{#2}{#3}{#4}
content of the box
\end{boitetheorembox}
where:

- #1 is the name of the background color of the box defined with the syntax of the package xcolor (of course the color has to be defined before using it if it is not a standard color of the package xcolor);
- #2: color of the content of the box defined with a color command of pstricks (in theorems this parameter is by default empty);
- #3: width of the border of the box (a valid measure must be typed; in theorems this parameter is fixed by default to 0.5pt);
- #4: letf margn of the environment (a valid measure must be typed; in theorems this parameter is fixed by default to 0pt);

6   Other environments

Four other types of numbered environment are predefined in mytheorem: they are genericAno, genericBno, genericCno, and genericDno. (the environment genericBno was used,

with command \newmytheoremw{genericBno}[margin]{}{exemples}{}

to number the various theorems environments in Sections 2.3 et 2.4 redefining the following commands:

\def\NgenericBmarginfont{\blue\bfseries\upshape}

\def\BTHMgenericBmargin{\formatbflgenericBno}

\colorlet{cblgenericBno}{blue!10} et \colorlet{cflgenericBno}{blue}).

the definition syntax is the one of numbered theorems environments without labels (section 2.1) that is

\newmytheoremw

with the following differences, the letter X in the commands below being replaced by A or B or C or D:

- ☛ These environments dors not have a default style; **then it must be typed in the definition**;
- ☛ With option [boite]=[b] (using or not using [bars/box/mdframed]) the type [margin] **must** be chosen;
- ☛ With option [boite]=[b] the options [bars/box/mdframed] available are only [onebar], [twobar], and [box];
- ☛ Without option [boite]=[b] available styles are [plain] and [margin];
- ☛ With style [margin] the number and the optional argument are constructed with command \BTHMgenericXmargin whose default is \hspace*{\parindent};
- ☛ With options [boite]=[b] and [bars/box/mdframed]=[box], the number and the optional argument of theorems are put in a box by the command \BTHMgenericXmarginbox whose default is
\def\BTHMgenericXmarginbox{\formatbflgenericXno};

In all these environments the default font of the body is \normalfont\upshape and,with options [boite]=[b] and [bars-/box/mdframed]=[box], its color can be change redefining the command \colorgenericXnoboxtext as explained here. and the color colorgenericXnobox of the background of the box as recalled here.

Minimal Environment by default:

1   This environment has been defined with the command

\newmytheoremw{genericAno}[plain]{}{geneamin}{}

With margin style:

1   This environment has been defined with the command: `\newmytheoremw{genericAno}[margin]{}{geneamar}{}`

1 **Optional Argument**

This environment has been defined with the command

$$\text{\texttt{\textbackslash newmytheoremw[b]\{genericAno\}[margin]\{\}[box]\{genea\}\{\}}}$$

the number being formatted with the default command by

`\def\NgenericAmarginfont{\bfseries\upshape\fcolorbox{black}{colorgenericAnobox}}`

and the optional argument, by default, by

`\def\BTHMgenericAmarginbox{\fcolorbox{black}{colorgenericAnobox}}`

Without optional argument:

2 This environment has been defined with the command

$$\text{\texttt{\textbackslash newmytheoremw[b]\{genericAno\}[margin]\{\}[box]\{genea\}\{\}}}$$

the number being formatted with the command

`\def\NgenericAmarginfont{\bfseries\upshape\fcolorbox{black}{colorgenericAnobox}}`