The geometry package

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Abstract

This package provides a flexible and easy interface to page dimensions. You can set the page layout with intuitive parameters. For instance, if you want to set a margin to 2cm from each edge of the paper, you can go just \usepackage[margin=2cm]{geometry}.

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1 Preface to version 4

Many improvements to the code and documentation were made according to suggestions and comments from users. Main changes are listed below.

- More robust driver detection.

  The driver detection method has been totally rewritten so that it can automatically detect the driver appropriate for the typesetting program in use. Therefore, explicit driver setting is no longer needed in most cases, except for the driver dvipdfm. This improvement makes geometry work more robustly for typesetting programs under e\TeX, \texttt{Xe\TeX} and \texttt{VTeX} as well as normal \TeX environment. The packages ifpdf and if\texttt{v}tex are used, which are available in CTAN. See Section 6.5 for details. Note that if\texttt{v}tex package v1.3 (2007/09/09) had a bug (a typo) that made the detection of \texttt{VTeX} wrong. So make sure if\texttt{v}tex v1.4 or later is being used.

- New option: \reset\texttt{paper}.

  This option disables explicit paper setting in geometry and uses the paper size specified before geometry. This option may be useful to print nonstandard sized documents with normal printers and papers.
- Added adjustment to \texttt{topskip}.
  When \texttt{lines} option and large font sizes are specified, \texttt{topskip} can be adjusted so that the formula "$\text{\texttt{textheight}} = (\text{lines} - 1) \times \text{\texttt{baselineskip}} + \text{\texttt{topskip}}"" to be correct. To do this, \texttt{topskip} is set to $\text{\texttt{ht}}\text{\texttt{strutbox}}$, if \texttt{topskip} is smaller than $\text{\texttt{ht}}\text{\texttt{strutbox}}$.

- Added ANSI paper sizes.
  New paper size definitions for ANSI A to E are added.

- Fixed wrong ISO paper sizes.
  The paper sizes for A1,A2,A5 and A6 were wrong (by 1mm).

- Fixed pdf\TeX\ magnification problem.
  PDF paper offset is adjusted properly when magnification is set by \texttt{mag} option with pdf\TeX{}.

- Changed package source organization.
  Files \texttt{geometry.ins} and \texttt{geometry-samples.tex} as well as \texttt{geometry.sty} are integrated into \texttt{geometry.dtx} so that they can be generated from \texttt{geometry.dtx} by \texttt{tex} command. Documentation can be also generated directly from \texttt{geometry.dtx} by \texttt{(pdf)latex} command.

2 Preface to version 3

The \texttt{geometry} package becomes even more flexible and powerful with the release of version 3. This new release contains major changes and enhancements in user interface, calculation schemes and the default settings of the page dimensions.

- New default layout.
  The ‘automatic’ centering is no longer default layout. Instead of centering, the idea of margin ratio and common values for default settings are introduced: the ratio of left (inner) margin to right (outer) margin is set 1:1 (2:3 for twoside), and the ratio of top to bottom is set 2:3. The margin ratios can be specified by newly introduced options, e.g. \texttt{marginratio} (see Section 4.2 and 6.3 for the detail). In addition, the spaces for the head and foot of the page are disregarded in calculating the placement of the text area by default. Furthermore the default \texttt{scale} of the type area is set to 0.7 with 70\% of the width and height of the paper. If you want to use the old default layout of version 2.3 or earlier, add \texttt{compat2} as a first option, e.g., \texttt{\usepackage[compat2,left=1.5in]{geometry}}, which sets the old default options [\texttt{scale}=$\{0.8,0.9\}$, \texttt{centering}, \texttt{includeheadfoot}] and allows the subsequent options to behave as if they are used in the old version. See also Section 7.1 for the detail of the default layout.

- Option \texttt{twosideshift} is obsoleted.
  \texttt{twoside} and other geometry options can substitute for it. A new option \texttt{bindingoffset} might be also helpful to control margins for oneside/twoside. For the detail, see Section 6.3.

- Option \texttt{includemp} becomes independent of \texttt{marginparwidth} and \texttt{marginparsep}.
  In the previous version, \texttt{marginparwidth} or \texttt{marginparsep} automatically set \texttt{includemp}=true. Now if you want \texttt{includemp} mode, \texttt{includemp} should be set explicitly.

- Options \texttt{nohead}, \texttt{nofoot} and \texttt{noheadfoot} become order-dependent and overwritable
  In the previous version, these options was order-independent: \texttt{nohead,headsep=10pt} resulted in just \texttt{\headsep=0pt, \headheight=0pt}, for example. But now they are overwritable by subsequent options. The above case results in $\texttt{\headheight=0pt}$ and $\texttt{\headsep=10pt}$.

- A complete set of options \texttt{ignore*} and \texttt{include*} for head, foot and marginpar.
  The previous version has only \texttt{includemp}, which denotes that the width of marginpar is included in the total body width. Now \texttt{ignore[head, foot, headfoot, mp, all]} and \texttt{include[head, foot, headfoot, all]} are newly added. If one of these \texttt{ignore*} is set, the corresponding space(s) are disregarded in auto-completion calculation. In version 3, \texttt{ignoreall} is set by default. So if you need to include the spaces for the head, foot and marginpar, the corresponding \texttt{include*} should be set explicitly. In addition, unlike the previous version, neither \texttt{reversemp, marginparwidth} nor \texttt{marginparsep} sets \texttt{includemp} automatically.
• **New option** `lines`.
The option enables users to specify `\textheight` by the number of lines included in `\textheight`, e.g., `lines=20`.

• **New option** `heightrounded`.
The option rounds `\textheight` to `n`-times (`n`: an integer) of `\baselineskip` plus `\topskip` to avoid “underfull vbox” in some cases.

• **New option** `screen`.
To make presentation with PC and video projector, geometry option `screen`, `centering` with ‘slide’ documentclass would be the best choice.

• **New option** `asymmetric`.
The option implements a twosided layout in which margins are not swapped on alternate pages and the marginal notes stay always on the same side.

• **New option** `showframe`.
The option displays visible frames for the text area and page, and lines for the head and foot to check layout in detail. Therefore `showframe.sty` is excluded from the `geometry` package distribution.

• **New option** `pass`.
The option disables auto-layout and all of the geometry settings except `verbose` and `showframe`. It can be used for checking out the page layout of the documentclass, other packages and manual settings without `geometry`.

See the text for the detail. All the new and modified options in this release are marked with ‘⋆3’ and ‘†3’ respectively.

### 3 Introduction

To set dimensions for page layout in \LaTeX{} is not straightforward. You need to adjust several \LaTeX{} native dimensions to place a text area where you want. If you want to center the text area in the paper you use, for example, you have to specify native dimensions as follows:

```
\usepackage{calc}
\setlength{textwidth}{7in}
\setlength{textheight}{10in}
\setlength{oddsidemargin}{(\paperwidth-\textwidth)/2 - 1in}
\setlength{topmargin}{(\paperheight-\textheight - \headheight - \headsep - \footskip)/2 - 1in}
```

Without package `calc`, the above example would need more tedious settings. Package `geometry` provides an easy way to set page layout parameters. In this case, what you have to do is just

```
\usepackage[text={7in,10in},centering]{geometry}
```

Besides centering problem, setting margins from each edge of the paper is also troublesome. But `geometry` also make it easy. If you want to set each margin 1.5in, you can go

```
\usepackage[margin=1.5in]{geometry}
```

In both cases, the unspecified dimensions are automatically determined. The package will be also useful when you have to set page layout obeying the following strict instructions: for example,

*The total allowable width of the text area is 6.5 inches wide by 8.75 inches high. The top margin on each page should be 1.2 inches from the top edge of the page. The left margin should be 0.9 inch from the left edge. The footer with page number should be at the bottom of the text area.*

In this case, using `geometry` you can go
Figure 1: Dimension names used in the \texttt{geometry} package. width=\texttt{textwidth} and height=\texttt{textheight} by default. \texttt{left}, \texttt{right}, \texttt{top} and \texttt{bottom} are margins. If margins on verso pages are swapped by \texttt{twoside} option, margins specified by \texttt{left} and \texttt{right} options are used for the inside and outside margins respectively. \texttt{inner} and \texttt{outer} are aliases of \texttt{left} and \texttt{right} respectively.

\usepackage[total={6.5in,8.75in},
top=1.2in, left=0.9in, includefoot]{geometry}.

Setting a text area on the paper in document preparation system has some analogy to placing a window on the background in the window system. The name ‘geometry’ comes from the \texttt{-geometry} option used for specifying a size and location of a window in X Window System.

4 Page geometry

4.1 Layout dimensions

To realize a straightforward setting for page layout, the following page structure is introduced: A paper contains a total body (printable area) and margins. The total body consists of a body (text area) with optional a header, a footer and marginal notes (marginpar). There are four margins: the left, right, top and bottom margins. For twosided documents, horizontal margins should be called the inner and outer margins.

Each margin is measured from the corresponding edge of a paper. For example, left margin (inner margin) means a horizontal distance between the left (inner) edge of the paper and that of the total body. Therefore the left and top margins defined in \texttt{geometry} are different from the native dimensions \texttt{\leftmargin} and \texttt{\topmargin}. The size of a body (text area) can be modified by \texttt{\textwidth} and \texttt{\textheight}.

The layout parts and the corresponding dimension names used in this package are showed schematically in Figure 1. The dimensions for paper, total body and margins have the following relations.

\begin{align*}
\text{paperwidth} &= \text{left} + \text{width} + \text{right} \quad (1) \\
\text{paperheight} &= \text{top} + \text{height} + \text{bottom} \quad (2)
\end{align*}

The dimensions of the total body, \texttt{width} and \texttt{height}, are defined as follows:

\begin{align*}
\text{width} &= \text{\textwidth} (+\text{marginparsep} + \text{marginparwidth}) \quad (3) \\
\text{height} &= \text{\textheight} (+\text{headheight} + \text{headsep} + \text{footskip}) \quad (4)
\end{align*}

In Equation (3), \texttt{width:=textwidth} by default, but \texttt{marginparsep} and \texttt{marginparwidth} are included in \texttt{width} if \texttt{includemp} option is set \texttt{true}. In Equation (4), \texttt{height:=textheight} by default. If
includehead is set to true, headheight and headsep are considered as a part of height in the vertical completion calculation. In the same way, includefoot includes footskip. Note that options ignore* just exclude the corresponding spaces from textheight, but do not change those lengths themselves. Figure 2 shows how these options work. Each of the seven dimensions in the right-hand side of Equations (3) and (4) corresponds to the ordinary \LaTeX{} control sequence with the same name.

Figure 3 illustrates various layouts with different layout modes. The dimensions for a header and a footer can be controlled by nohead or nofoot mode, which sets each length to 0pt directly. On the other hand, options ignore* do not change the corresponding native dimensions.

4.2 Auto-completion scheme

Suppose that the paper size is pre-defined in Equation (1) or (2), if two dimensions out of the three dimensions in the right-hand side of each equation are specified, the rest of the dimensions can be determined by the specified ones. However, when none or only one of the three dimensions is specified, the rest of the dimensions can’t generally be determined without some assumptions.

The geometry package has an auto-completion scheme with some default parameters to determine the unspecified dimensions independently for each direction. If the size of total body (i.e., width in the horizontal direction) is specified, the margins (left and right) can be determined with a default ratio of one margin to the other (left/right). If one margin is specified, the rest of dimensions can also be determined by the default margin ratio. Page margin setting by margin ratio was introduced in KOMA script\(^1\).

The default vertical margin ratio is 2/3, namely,

$$\text{top : bottom = } 2 : 3 \quad \text{default.} \quad (5)$$

As for the horizontal margin ratio, the default value depends on whether the document is onesided or twosided,

$$\text{left (inner)} : \text{right (outer)} = \begin{cases} 1 : 1 & \text{default for oneside,} \\ 2 : 3 & \text{default for twoside.} \end{cases} \quad (6)$$

Obviously the default horizontal margin ratio for oneside is ‘centering’.

For example, if one specifies right=2.4cm with a twosided layout in A4 paper (21.0cm×29.7cm), unspecified left and width are automatically determined using the default horizontal margin ratio (2/3) as follows:

$$\text{left} = (\text{horizontal-margin-ratio}) \times \text{right}$$
$$= \frac{2}{3} \times 2.4\text{cm} = 1.6\text{cm} \quad (7)$$

\(^1\)CTAN: macros/latex/contrib/koma-script by Frank Neukam and Markus Kohm.
Figure 3: Sample layouts for total body with different switches. (a) includeheadfoot, (b) includeall, (c) includefoot and (d) includefoot,includemp. If reversemp is set to true, the location of the marginal notes are swapped on every page. Option twoside swaps both margins and marginal notes on verso pages. Note that the marginal notes are printed on the page, even when ignoremp or includemp=false, but can fall off the page in some cases.
Table 1: Auto-completion rules. The mark ‘*’ in each row (left table) denotes the dimensions not specified explicitly, which can be determined as the corresponding Results (right table). \( \sigma \) denotes the value of margin ratio. Functions \( R(x) \) and \( M(x) \) are defined in Equation (12). The bottom case shows over-specification, which gives in the same result as the A-B case.

\[
\text{width} = \text{paperwidth} - \text{left} - \text{right} \\
= 21.0cm - 1.6cm - 2.4cm = 17.0cm. \quad (8)
\]

In this case, the vertical dimensions top, height and bottom are determined by the default vertical margin ratio with 2:3 and the default size of total body with 70% of the paper height:

\[
\text{height} = 0.7 \times \text{paperheight} \\
= 0.7 \times 29.7cm = 20.79cm \quad (9)
\]

\[
\text{top} = \frac{\langle \text{vertical-margin-ratio} \rangle}{1 + \langle \text{vertical-margin-ratio} \rangle} \times (\text{paperheight} - \text{height}) \\
= \frac{2}{2 + 3} \times (29.7cm - 20.79cm) \\
= 0.4 \times 8.91cm = 3.564cm \quad (10)
\]

\[
\text{bottom} = 0.6 \times 8.91cm = 5.346cm \quad (11)
\]

The auto-completion rules are shown in Table 1 and Equation (12). \( A, B \) and \( C \) in Table 1 are user-specified values, * denotes unspecified ones. The right-hand side table shows the corresponding results of auto-completion. The unspecified values can be determined by \( A, B \) and \( L \) (paperwidth or paperheight). In Table 1, functions \( R(x) \) and \( M(x) \) are defined as follows:

\[
R(x) = \frac{L - x}{x + \sigma(x)} \\
M(x) = \frac{R(x)}{1 + \sigma} \quad (12)
\]

Here \( \sigma \) denotes the ratio of left margin (inner) to right margin (outer) or the ratio of top to bottom. To set \( \sigma \) as a geometry option, you can use \{h,v\}marginratio options with a:b-type value, for example, hmarginratio=2:3.

\[
h\text{marginratio} = \text{left}:\text{right} \quad (13)
\]

\[
v\text{marginratio} = \text{top}:\text{bottom} \quad (14)
\]

By default, \( \sigma \) is 1/1 (=1) for oneside and 2/3 for twoside in the horizontal direction, and 2/3 in the vertical. If none of three dimensions is specified in each direction, the default setting is used: width and height is set to 70% of the paper width and height respectively. If all the three dimensions would be specified, margins remain and width or height is ignored.

5 User interface

5.1 General features

The geometry options using the keyval interface ‘\{key\}={value}’ can be set either in the optional argument to the \usepackage command, or in the argument of the \geometry macro. This macro, if
necessary, should be used only in the preamble, i.e., before \begin{document}. In either case, the argument consists of a list of comma-separated keyval options. The main features of setting options are listed below.

- Multiple lines are allowed. (But blank lines are not allowed.)
- Any spaces between words are ignored.
- Options are basically order-independent. (There are some exceptions. See Section 8.1 for details.)

For example,

\begin{verbatim}
\usepackage[ a5paper , hmargin = { 3cm, .8in } , height = 10in ]{geometry}
\end{verbatim}

is equivalent to

\begin{verbatim}
\usepackage{geometry}
\geometry{height=10in,a5paper,hmargin={3cm,0.8in}}
\end{verbatim}

Some options are allowed to have sub-list, e.g. \{3cm,0.8in\}. Note that the order of values in the sub-list is significant. The above setting is also equivalent to the followings:

\begin{verbatim}
\usepackage{geometry}
\geometry{height=10in,a5paper,hmargin={3cm,0.8in}}
\end{verbatim}

or

\begin{verbatim}
\usepackage{calc}
\usepackage[textheight=20\baselineskip+10pt]{geometry}
\end{verbatim}

5.2 Option types

Geometry options are categorized into four types:

1. **Boolean type**
   
   takes a boolean value (true or false). If no value, true is set by default.

   \begin{verbatim}
   \langle key \rangle = \text{true} | \text{false}.
   \end{verbatim}

   \langle key \rangle with no value is equivalent to \langle key \rangle = \text{true}.

   Examples: verbose=true, includehead, twoside=false.

   Paper name is the exception. The preferred paper name should be set with no values. Whatever value is given, it is ignored. For instance, a4paper=XXX is equivalent to a4paper.

2. **Single-valued type**
   
   takes a mandatory value.

   \begin{verbatim}
   \langle key \rangle = \langle value \rangle.
   \end{verbatim}

   Examples: width=7in, left=1.25in, footskip=1cm, height=.86\paperheight.

3. **Double-valued type**
   
   takes a pair of comma-separated values in braces. The two values can be shortened to one value if they are identical.

   \begin{verbatim}
   \langle key \rangle = \{ \langle value1 \rangle , \langle value2 \rangle \}.
   \langle key \rangle = \langle value \rangle is equivalent to \langle key \rangle = \{ \langle value \rangle , \langle value \rangle \}.
   \end{verbatim}

\footnote{CTAN: macros/latex/required/tools}
Examples: \hmargin={1.5in,1in}, \scale=0.8, \body={7in,10in}.

4. Triple-valued type
takes three mandatory, comma-separated values in braces.
\( \langle \text{key} \rangle = \langle \text{value1}, \text{value2}, \text{value3} \rangle \)

Each value must be a dimension or null. When you give an empty value or ‘*’, it means null and leaves the appropriate value to the auto-completion mechanism. You need to specify at least one dimension, typically two dimensions. You can set nulls for all the values, but it makes no sense.
Examples:
\[ \hdivide={2cm,*,1cm}, \vdivide={3cm,19cm}, \divide={1in,*,1in}. \]

6 Option specification
This section describes all the options provided by geometry.

6.1 Paper size
The options below set paper/media size and orientation.
\begin{itemize}
  \item \texttt{paper} | \texttt{papername}
    \begin{itemize}
      \item specifies a paper name. The paper names available in geometry. \texttt{paper=⟨paper-name⟩}.
      \item For example \texttt{paper=a4paper}, which is equivalent to just \texttt{a4paper}.
      \item \texttt{a0paper}, \texttt{a1paper}, \texttt{a2paper}, \texttt{a3paper}, \texttt{a4paper}, \texttt{a5paper}, \texttt{a6paper}
      \item \texttt{b0paper}, \texttt{b1paper}, \texttt{b2paper}, \texttt{b3paper}, \texttt{b4paper}, \texttt{b5paper}, \texttt{b6paper}
      \item \texttt{ansiapaper}, \texttt{ansiwpaper}, \texttt{ansicpaper}, \texttt{ansidpaper}, \texttt{ansiepaper}
      \item \texttt{letterpaper}, \texttt{executivepaper}, \texttt{legalpaper}
    \end{itemize}
  \item \texttt{screen}
    \begin{itemize}
      \item a special paper size with (W,H) = (225mm,180mm). For presentation with PC and video projector, “screen,centering” with ‘slide’ documentclass would be useful.
    \end{itemize}
  \item \texttt{paperwidth}
    \begin{itemize}
      \item width of the paper. \texttt{paperwidth=⟨length⟩}.
    \end{itemize}
  \item \texttt{paperheight}
    \begin{itemize}
      \item height of the paper. \texttt{paperheight=⟨length⟩}.
    \end{itemize}
  \item \texttt{papersize}
    \begin{itemize}
      \item width and height of the paper. \texttt{papersize=⟨⟨width⟩,⟨height⟩⟩ or papersize=⟨⟨length⟩⟩}.
    \end{itemize}
  \item \texttt{landscape}
    \begin{itemize}
      \item switches the paper orientation to landscape mode.
    \end{itemize}
  \item \texttt{portrait}
    \begin{itemize}
      \item switches the paper orientation to portrait mode. This is equivalent to \texttt{landscape=false}.
    \end{itemize}
\end{itemize}

Options for paper names (e.g., \texttt{a4paper}) and orientation (\texttt{portrait} and \texttt{landscape}) can be set as document class options. For example, you can set \texttt{\documentclass[a4paper,landscape]{article}}, then \texttt{a4paper} and \texttt{landscape} are processed in geometry as well. This is also the case for \texttt{twoside} and \texttt{twocolumn} (see also Section 6.4).

6.2 Body size
The options specifying the size of total body are described in this section.
\begin{itemize}
  \item \texttt{hscale}
    \begin{itemize}
      \item ratio of width of total body to \texttt{\paperwidth}. \texttt{hscale=⟨h-scale⟩}, e.g., \texttt{hscale=0.8} is equivalent to \texttt{width=0.8\paperwidth}. (0.7 by default)
    \end{itemize}
  \item \texttt{vscale}
    \begin{itemize}
      \item ratio of height of total body to \texttt{\paperheight}, e.g., \texttt{vscale=⟨v-scale⟩}. (0.7 by default) \texttt{vscale=0.9} is equivalent to \texttt{height=0.9\paperheight}.
    \end{itemize}
  \item \texttt{scale}
    \begin{itemize}
      \item ratio of total body to the paper. \texttt{scale=⟨⟨h-scale⟩,⟨v-scale⟩⟩ or scale=⟨⟨scale⟩⟩}. (0.7 by default)
    \end{itemize}
\end{itemize}
width | totalwidth
---|---
width of total body. width={(length)} or totalwidth={(length)}. This dimension should not be confused with textwidth. Generally, width ≥ textwidth because width includes the width of the marginal notes if includemp is set to true. If textwidth and width are specified at the same time, width is ignored.

height | totalheight
---|---
height of total body, excluding header and footer by default. If includehead or includelfoot is set, height includes the head or foot of the page as well as textheight. height={(length)} or totalheight={(length)}. If both textheight and height are specified, height will be ignored.

total width and height of total body.
total={⟨width⟩, ⟨height⟩} or total={⟨length⟩}.

textwidth modifies \textwidth, the width of body (the text are). textwidth={(length)}.

textheight modifies \textheight, the height of body. textheight={(length)}.

text | body
---|---
sets both \textwidth and \textheight of the body of page. body={⟨width⟩, ⟨height⟩} or text={⟨length⟩}.

lines
---
enables users to specify \textheight by the number of lines. lines={⟨integer⟩}.

includehead
---
includes the head of the page, \headheight and \headsep, into total body. It is set to false by default. It is opposite to ignorehead. See Figure 2.

includelfoot
---
includes the foot of the page, \footskip, into total body. It is opposite to ignorefoot. It is false by default. See Figure 2.

includeheadfoot
---
sets both includehead and includelfoot to true, which is opposite to ignoreheadfoot. See Figure 2.

includemp
---
includes the margin notes, \marginparwidth and \marginparsep, into body when calculating horizontal calculation. In version 3, includemp is independent of options marginparwidth and marginparsep, and set to false by default.

includeall
---
sets both includeheadfoot and includemp to true. See Figure 2 and Figure 3.

ignorehead
---
disregards the head of the page, headheight and headsep, in determining vertical layout, but does not change those lengths. It is equivalent to includehead=false. It is set to true by default. See also includehead.

ignorefoot
---
disregards the foot of page, footskip, in determining vertical layout, but does not change that length. This option is set to true by default. See also includefoot.

ignoreheadfoot
---
sets both ignorehead and ignorefoot to true. See also includeheadfoot.

ignoreemp
---
disregards the marginal notes in determining the horizontal margins (true is set by default). If marginal notes fall off the page, the warning message will be displayed when verbose=true. See also Figure 3 and includemp.

ignoreall
---
sets both ignoreheadfoot and ignoreemp to true. See also includeall.

heightrounded
---
This option rounds \textheight to n-times (n: an integer) of \baselineskip plus \topskip to avoid “underfull vbox” in some cases. For example, if \textheight is 486pt with \baselineskip 12pt and \topskip 10pt, then

\[ (39 \times 12 pt + 10 pt =) \geq 48pt < 486 pt < 490 pt (= 40 \times 12 pt + 10 pt), \]

as a result \textheight is rounded to 490pt. heightrounded=false by default.

The following options can specify body and margins simultaneously with three comma-separated values in braces.

hdivide
---
horizontal partitions (left,width,right). hdivide={⟨left margin⟩, ⟨width⟩, ⟨right margin⟩}. Note that you should not specify all of the three parameters. The best way of using this option is to specify two of three and leave the rest with null(nothing) or ‘*’. For example, when you set hdivide={2cm, 15cm, }, the margin from the right-side edge of page will be determined calculating paperwidth=2cm-15cm.

vdivide
---
vertical partitions (top,height,bottom). vdivide={⟨top margin⟩, ⟨height⟩, ⟨bottom margin⟩}.

divide
---
divide={A, B, C} is interpreted as hdivide={A, B, C} and vdivide={A, B, C}. 10
6.3 Margin size

The options specifying the size of visible margins are listed below.

- **left | lmargin | inner**
  - Left margin (for oneside) or inner margin (for twoside) of total body. In other words, the distance between the left (inner) edge of the paper and that of total body.
  - `left=⟨length⟩`. `inner` has no special meaning, just an alias of `left` and `lmargin`.

- **right | rmargin | outer**
  - Right or outer margin of total body. `right=⟨length⟩`.

- **top | tmargin**
  - Top margin of the page. `top=⟨length⟩`. Note this option has nothing to do with the native dimension \topmargin.

- **bottom | bmargin**
  - Bottom margin of the page. `bottom=⟨length⟩`.

- **hmargin**
  - Left and right margin. `hmargin=⟨left margin⟩,⟨right margin⟩` or `hmargin=⟨length⟩`.

- **vmargin**
  - Top and bottom margin. `vmargin=⟨top margin⟩,⟨bottom margin⟩` or `vmargin=⟨length⟩`.

- **margin**
  - `margin=⟨A,B⟩` is equivalent to `hmargin=⟨A,B⟩` and `vmargin=⟨A,B⟩`. `margin=⟨A⟩` is automatically expanded to `hmargin=⟨A⟩` and `vmargin=⟨A⟩`.

- **hmarginratio**
  - Horizontal margin ratio of `left` (inner) to `right` (outer). The value of `⟨ratio⟩` should be specified with colon-separated two values. Each value should be a positive integer less than 100 to prevent arithmetic overflow, e.g., `2:3` instead of `1:1.5`. The default ratio is `1:1` for oneside, `2:3` for twoside.

- **vmarginratio**
  - Vertical margin ratio of `top` to `bottom`. The default ratio is `2:3`.

- **marginratio**
  - Horizontal and vertical margin ratios. `marginratio=⟨horizontal ratio⟩,⟨vertical ratio⟩` or `marginratio=⟨ratio⟩`.

- **hcentering**
  - Sets auto-centering horizontally and is equivalent to `hmarginratio=1:1`. It is set to `true` by default for oneside. See also `hmarginratio`.

- **vcentering**
  - Sets auto-centering vertically and is equivalent to `vmarginratio=1:1`. The default is `false`. See also `vmarginratio`.

- **centering**
  - Sets auto-centering and is equivalent to `marginratio=1:1`. The default is `false`. See also `marginratio`.

- **twoside**
  - Switches on twoside mode with left and right margins swapped on verso pages. The option sets \@twoside and \@mparswitch switches. See also `asymmetric`.

- **asymmetric**
  - Implements a twosided layout in which margins are not swapped on alternate pages (by setting \oddsidemargin to \evensidemargin + bindingoffset) and in which the marginal notes stay always on the same side. This option can be used as an alternative to the twoside option. See also `twoside`.

- **bindingoffset**
  - Removes a specified space from the lefthand-side of the page for.oneside or the inner-side for twoside. `bindingoffset=⟨length⟩`. This is useful if pages are bound by a press binding (glued, stitched, stapled ...). See Figure 4.

- **hdivide**
  - See description in Section 6.2.

- **vdivide**
  - See description in Section 6.2.

- **divide**
  - See description in Section 6.2.

6.4 Native dimensions

The options below specify \LaTeX{} native dimensions and switches for page layout. See Figure 1. Note that unlike version 2.3, nohead, nofoot and noheadfoot become overwritable, in other words, just shorthand for setting the corresponding \LaTeX{} dimensions (\headheight, \headsep and \footskip) to 0pt.

- **headheight | head**
  - Modifies `\headheight`, height of header. `headheight=⟨length⟩` or `head=⟨length⟩`.
Figure 4: bindingoffset option. Note that twoside option swaps the horizontal margins and the marginal notes together with bindingoffset on even pages (see b), but asymmetric option suppresses the swap of the margins and marginal notes (but bindingoffset is still swapped).

headsep modifies \headsep, separation between header and text (body). headsep = \langle length \rangle.

footskip | foot modifies \footskip, distance separation between baseline of last line of text and baseline of footer. footskip = \langle length \rangle or foot = \langle length \rangle.

nohead eliminates spaces for the head of the page, which is equivalent to both \headheight = 0pt and headsep = 0pt.

nofoot eliminates spaces for the foot of the page, which is equivalent to \footskip = 0pt.

noheadfoot equivalent to nohead and nofoot, which means that headheight, headsep and footskip are all set to 0pt.

footnotesep changes the dimension \skip\footins, separation between the bottom of text body and the top of footnote text.

marginparwidth | marginpar modifies \marginparwidth, width of the marginal notes. marginparwidth = \langle length \rangle.

Unlike version 2.3, it does not set includemp=true.

marginparsep modifies \marginparsep, separation between body and marginal notes. marginparsep = \langle length \rangle.

Unlike version 2.3, it does not set includemp=true.

nomarginpar shrinks spaces for marginal notes to 0pt, which is equivalent to \marginparwidth = 0pt and \marginparsep = 0pt.

columnsep modifies \columnsep, the separation between two columns in twocolumn mode.

hoffset modifies \hoffset. hoffset = \langle length \rangle.

voffset modifies \voffset. voffset = \langle length \rangle.

offset horizontal and vertical offset. offset = \langle hoffset \rangle, \langle voffset \rangle or offset = \langle length \rangle.

twocolumn sets twocolumn mode with @twocolumntrue. twocolumn = false denotes onecolumn mode with @twocolumnfalse.

twoside sets both @twosidetrue and @mparswitchtrue. See Section 6.3.

textwidth sets \textwidth directly. See Section 6.2.

textheight sets \textheight directly. See Section 6.2.

reversemargpar makes the marginal notes appear in the left (inner) margin with @reversemargintrue. Unlike version 2.3 or earlier, it does not change includemp mode. This is false by default.
6.5 drivers

Package geometry supports dvips, dvipdfm including its derivatives dvipdfmx and xdvipdfmx, pdftex for pdflatex, and vtex for VTeX environment. These driver options are exclusive. The driver can be set by either driver=(driver name) or any of the drivers directly like pdftex. A driver auto-detection mechanism is introduced in version 4. Therefore, you don’t have to set a driver in most cases, except for dvipdfm. Setting driver=auto makes the auto-detection work whatever the previous setting is. Setting driver=none does nothing for driver.

driver sets driver. driver=(driver name). dvips, dvipdfm, pdftex, vtex, auto and none are available as a driver name.

The options below can be set directly instead of driver=(value).

dvips writes the paper size in dvi output with the \special macro. If you use dvips as a DVI-to-PS driver, for example, to print a document with \geometry{a3paper,landscape} on A3 paper in landscape orientation, you don’t need options “-t a3 -t landscape” to dvips.

dvipdfm works like dvips except landscape correction.
pdftex sets \pdfpagewidth and \pdfpageheight internally.
vtext sets dimensions \mediawidth and \mediaheight for VTeX. When this driver is selected (explicitly or automatically), geometry will auto-detect which output mode (DVI, PDF or PS) is selected in VTeX, and do proper settings for it.

If explicit driver setting is mismatched with the typesetting program in use, the default driver dvips would be selected.

6.6 Other options

The other useful options are described here.

verbose displays parameter results on the terminal. verbose=false (default) still puts them into the log file.

reset sets back the layout dimensions and switches to the settings before geometry is loaded. Options given in geometry.cfg are also cleared. Note that this cannot reset pass and mag with truedimen. reset=false has no effect and cannot cancel the previous reset=(true) if any. For example, when you go

\documentclass[landscape]{article}
\usepackage[twoside,reset,left=2cm]{geometry}

with \ExecuteOptions{scale=0.9} in geometry.cfg, then as a result, landscape and left=2cm remain effective, and scale=0.9 and twoside are ineffective.

mag sets magnification value (\mag) and automatically modifies \hoffset and \voffset according to the magnification. mag=(value). Note that (value) should be an integer value with 1000 as a normal size. For example, mag=1414 with a4paper provides an enlarged print fitting in a3paper, which is 1.414 (=√2) times larger than a4paper. Font enlargement needs extra disk space. Note that setting mag should precede any other settings with ‘true’ dimensions, such as 1.5truein, 2truecm and so on. See also truedimen option.

truedimen changes all internal explicit dimension values into true dimensions, e.g., 1in is changed to 1truein. Typically this option will be used together with mag option. Note that this is ineffective against externally specified dimensions. For example, when you set “mag=1440, margin=10pt, truedimen”, margins are not ‘true’ but magnified. If you want to set exact margins, you should set like “mag=1440, margin=10truept, truedimen” instead.

pass disables all of the geometry options and calculations except verbose and showframe. It can be used for checking out the page layout of the documentclass, other packages and manual settings without geometry.

showframe shows visible frames for the text area and page, and the lines for the head and foot on the first page.
compat2 sets all kind of options so that \usepackage[compat2]{geometry} would behave as if one is using the old version (v2.3) with the old default layout: \texttt{scale=\{0.8,0.9\}, centering, includeheadfoot}, which is here expressed by options available in version 3. Note this option should be set as a first option.

7 Default settings

7.1 Default layout

Let us recapitulate the default layout here. The \texttt{geometry} package has the following default page layout for onesided documents:

\begin{verbatim}
  scale=0.7, marginratio={1:1, 2:3}, ignoreall
\end{verbatim}

For twoside, the horizontal margin ratio is also set 2:3,

\begin{verbatim}
  scale=0.7, marginratio=2:3, ignoreall.
\end{verbatim}

Of course, you don’t need to set them explicitly. \texttt{\usepackage{geometry}} will internally set the above options. Additional options will overwrite the layout dimensions. For example,

\begin{verbatim}
  \usepackage[hmargin=2cm]{geometry}
\end{verbatim}

will overwrite horizontal dimensions, but use the default for vertical layout. Page dimensions specified by the documentclass being used and other direct settings before \texttt{geometry} is loaded are passed down to \texttt{geometry}.

Note version 2.3 or earlier had default layout different from the version 3. The old default options can be expressed with options available in the current version:

\begin{verbatim}
  scale={0.8,0.9}, centering, includeheadfoot.
\end{verbatim}

Adding \texttt{compat2} as a first option sets those options so that, for example,

\begin{verbatim}
  \usepackage[compat2, width=10cm]{geometry}
\end{verbatim}

would behave as if one is using the old version (v2.3).

7.2 Configuration file

One can set up a configuration file to make default options. To do this, produce a file \texttt{geometry.cfg} containing an \texttt{\ExecuteOptions} macro, for example,

\begin{verbatim}
  \ExecuteOptions{a4paper,dvips}
\end{verbatim}

and install it somewhere TeX can find it.

The options specified in the \texttt{geometry.cfg} can be cleared by option \texttt{reset}.

8 Relations between options

This section shows how complexity is solved when options are over-specified.

8.1 Order dependence

The \texttt{geometry} options are basically order-independent, but there are some exceptions. For multiple specification of the same option, the last setting is adopted. For example,

\begin{verbatim}
  verbose=true, verbose=false
\end{verbatim}

obviously results in \texttt{verbose=false}. If you set

\begin{verbatim}
  hmargin={3cm,2cm}, left=1cm
\end{verbatim}

the left(or inner) margin is overwritten by \texttt{left=1cm}. As a result, it is equivalent to \texttt{hmargin={1cm,2cm}}.

The \texttt{reset} option removes all the geometry options (except \texttt{pass}) before it. If you set

\begin{verbatim}
  \usepackage[reset]{geometry}
\end{verbatim}
then \texttt{margin=1cm, twoside} and \texttt{a5paper} are removed. As a result, this case is equivalent to

\documentclass[landscape]{article}
\usepackage[left=2cm]{geometry}
\begin{document}

The \texttt{mag} option should be set in advance of any other settings with ‘true’ length, such as \texttt{left=1.5truecm, width=5truein} and so on. The \texttt{mag} primitive can be set before this package is called.

\section{Priority}

There are several ways to set dimensions of the printable area: \texttt{scale, total, text} and \texttt{lines}. Basically specification with the more concrete dimension has the higher priority:

\begin{equation}
\begin{array}{c}
\text{low} \rightarrow \text{high} \ (\text{priority}) \\
\{ \text{hscale} \} < \{ \text{width} \} < \{ \text{textwidth} \} < \{ \text{text} \} < \{ \text{lines} \}.
\end{array}
\end{equation}

For example,

\begin{verbatim}
\usepackage[hscale=0.8, textwidth=7in, width=18cm]{geometry}
\end{verbatim}

is the same as \begin{verbatim}\usepackage[textwidth=7in]{geometry}\end{verbatim}. Another example:

\begin{verbatim}
\usepackage[lines=30, scale=0.8, text=7in]{geometry}
\end{verbatim}

results in \begin{verbatim}[lines=30, textwidth=7in]\end{verbatim}.

Options determining margin size also have priority rule: margin ratios versus margin length. For example, if both \texttt{marginratio=1:2} and \texttt{margin=1cm} are set at the same time, \texttt{margin=1cm} wins because \texttt{margin=1cm} is more concrete dimension than ratios. That is why normal margin options work well with default margin ratios (\texttt{marginratio=\{1:1, 2:3\}} for oneside).

\begin{equation}
\begin{array}{c}
\text{low} \rightarrow \text{high} \ (\text{priority}) \\
\{ \text{hmarginratio} \} < \{ \text{vmarginratio} \} < \{ \text{marginratio} \}.
\end{array}
\end{equation}

\section{Examples}

- A onesided page layout with the text area centered in the paper. The examples below have the same result because the horizontal margin ratio is set 1:1 for oneside by default.
  - centering
  - \texttt{marginratio=1:1}
  - \texttt{vcentering}

- A twosided page layout with the inside offset for binding 1cm.
  - \texttt{twoside, bindingoffset=1cm}

In this case, \texttt{textwidth} is shorter than the case without \texttt{bindingoffset=1cm} by $0.7 \times 1\text{cm}$ ($=0.7\text{cm}$).

- A layout with the left, right, and top margin 3cm, 2cm and 2.5in respectively, with \texttt{textheight} of 40 lines, and with the head and foot of the page included in \texttt{total body}. The two examples below have the same result.
• A layout with the height of total body 10\text{in}, the bottom margin 2\text{cm}, and the default width. The top margin will be calculated automatically. Each solution below results in the same page layout.

- vdivide={*, 10\text{in}, 2\text{cm}}
- bmargin=2\text{cm}, height=10\text{in}
- bottom=2\text{cm}, textheight=10\text{in}

Note that dimensions for head and foot are excluded from height of total body. An additional includefoot makes \footskip included in totalheight. Therefore, in the two cases below, textheight in the former layout is shorter than the latter (with 10\text{in} exactly) by \footskip. In other words, height = textheight + \footskip when includefoot=true in this case.

- bmargin=2\text{cm}, height=10\text{in}, includefoot
- bottom=2\text{cm}, textheight=10\text{in}, includefoot

• A layout with textwidth and textheight 90\% of the paper and with body centered. Each solution below results in the same page layout.

- scale=0.9, centering
- text={.9\textwidth,.9\text{paperheight}}, ratio=1:1
- width=.9\textwidth, vmargin=.05\text{paperheight}, marginratio=1:1
- hdivide={*,0.9\textwidth,*}, vdivide={*,0.9\text{paperheight},*}(as for onesided documents)
- margin={0.05\textwidth,0.05\text{paperheight}}

You can add heightrounded to avoid an “underfull vbox warning” like

\text{Underfull \vbox (badness 10000) has occurred while \output is active.}

See Section 6.2 for the detail description about heightrounded.

• A layout with the width of marginal notes 3\text{cm} and included in the width of total body. The following examples are the same.

- marginparwidth=3\text{cm}, includemp
- marginpar=3\text{cm}, ignoremp=false

• A layout the full scale body of the paper with A5 paper in landscape. The following examples are the same.

- a5paper, landscape, scale=1.0
- landscape=TRUE, paper=a5paper, margin=0pt

• A screen size layout appropriate to presentation with PC and video projector.

\documentclass{slide}
\usepackage[screen,margin=0.8in]{geometry}
...
\begin{slide}
...
\end{slide}

• A layout with fonts and spaces both enlarged from A4 to A3. In the case below, the resulted paper size is A3.

- a4paper, mag=1414.

If you want to have a layout with two times bigger fonts, but without changing paper size, you can go
You can add dvips option, that is useful to preview it with proper paper size by dviout or xdvi.

- letterpaper, mag=2000, truedimen.

An old style setting with v2.3 or earlier

\usepackage[a4paper,mag=1200, truedimen, margin=2cm, twoside, headsep=7pt, headheight=14.5pt, marginparwidth=30pt]{geometry}

can be rewritten with options in version 3 without compat2:

\usepackage[calc]
\usepackage[a4paper, margin=2cm, twoside, left=2cm+10pt, right=2cm-10pt, includeheadfoot, headsep=7pt, headheight=14.5pt, includemp, marginparwidth=30pt]{geometry}

In this case, \texttt{includeall} can be used instead of \texttt{includeheadfoot} and \texttt{includemp}.

- A complex page layout.

\usepackage[a5paper, landscape, twocolumn, twoside, left=2cm, hmarginratio=2:1, includemp, marginparwidth=43pt, bottom=1cm, foot=.7cm, includefoot, textheight=11cm, heightrounded, columnsep=1cm, dvips, verbose]{geometry}

Try typesetting it and checking out the result yourself. :-)

10 Known problems

- With pdftex=true, mag ≠ 1000 and truedimen, paperwidth and paperheight shown in verbose mode are different from the real size of the resulted PDF. The PDF itself is correct anyway.

- With pdftex=true, mag ≠ 1000, no truedimen, and hyperref, hyperref should be loaded by \texttt{usepackage} before geometry. Otherwise the resulted PDF size will become wrong.

- With crop package and mag ≠ 1000, \texttt{center} option of crop doesn’t work well.

11 Acknowledgments


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12 Implementation

\begin{verbatim}
1 ⟨∗package⟩

This package requires three other packages: keyval in \LaTeX\ graphics bundle, ifpdf and ifvtex in ‘oberdiek’ bundle.

2 \RequirePackage{keyval}\
3 \RequirePackage{ifpdf}\
4 \RequirePackage{ifvtex}\

Internal switches are declared here.

5 \newif\ifGm@verbose
\end{verbatim}

17
Counters for horizontal and vertical partitioning patterns.
\newcount\Gm@cnth
\newcount\Gm@cntv
\c@Gm@tempcnt
The counter is used to set number with calc.
\newcount\c@Gm@tempcnt
\Gm@bindingoffset
An additional inner offset for binding.
\newdimen\Gm@bindingoffset
\Gm@wd@mp
\Gm@odd@mp
\Gm@even@mp
Correction lengths for \textwidth, \oddsidemargin and \evensidemargin in includemp mode.
\newdimen\Gm@wd@mp
\newdimen\Gm@odd@mp
\newdimen\Gm@even@mp
\Gm@dimlist
Native dimension setting list.
\newtoks\Gm@dimlist
\Gm@warning
Macro for printing warning messages.
\def\Gm@warning#1{\PackageWarningNoLine{geometry}{#1}}\%\def\Gm@warning#1{\PackageWarningNoLine{geometry}{#1}}\%
\@onlypreamble\Gm@warning
\Gm@Dhratio
The default values for the horizontal and vertical \texttt{marginalratio} are defined. \Gm@Dhratiotwo denotes the default value of horizontal marginalratio for twoside page layout with left and right margins swapped on verso pages, which is set by \texttt{twoside}.
\def\Gm@Dhratio{1:1}\% = left:right default for oneside
\def\Gm@Dhratiotwo{2:3}\% = inner:outer default for twoside.
\def\Gm@Dvratio{2:3}\% = top:bottom default
\@onlypreamble\Gm@Dhratio
\@onlypreamble\Gm@Dhratiotwo
\@onlypreamble\Gm@Dvratio
\Gm@Dhscale
The default values for the horizontal and vertical \texttt{scale} are defined. In version 3 the default scale has been changed from \{0.8, 0.9\} to \{0.7, 0.7\} in each direction.
\def\Gm@Dhscale{0.7}\%
\def\Gm@Dvscale{0.7}\%
\@onlypreamble\Gm@Dhscale
\@onlypreamble\Gm@Dvscale
\Gm@dvips
The driver names.
\def\Gm@dvips{dvips}\%
\def\Gm@dvipdfm{dvipdfm}\%
\def\Gm@pdftex{pdftex}\%
\def\Gm@vtex{vtex}\%
\@onlypreamble\Gm@dvips
\@onlypreamble\Gm@dvipdfm
\@onlypreamble\Gm@pdftex
\@onlypreamble\Gm@vtex
These macros keep original paper (media) size intact.

The macro saves \LaTeX{} native dimensions and switches before processing geometry options, and is called when \texttt{reset} or \texttt{pass} is set.

The macro for initializing modes and flags is defined here. This macro is called at the beginning of the package and when \texttt{reset} is specified.

The macro sets the specified driver.

The macro unsets the specified driver if it has been set.
The macros set a boolean option.

\Gm@setbool
\Gm@setboolrev

The macros set a boolean option. The macros \Gm@setbool and \Gm@setboolrev set a boolean option. The macros \Gm@setbool and \Gm@setboolrev set a boolean option.

\Gm@doif
\Gm@doifelse

\Gm@doif executes the third argument #3 using a boolean value #2 of a option #1. \Gm@doifelse executes the third argument #3 if a boolean option #1 with its value #2 is true, and executes the fourth argument #4 if false.

\Gm@reverse

The macro reverses a bool value.

\Gm@checkbool

The macro is used in \Gm@showparams to print true or nothing.

\Gm@defbylen
\Gm@defbycnt

Macros \Gm@defbylen and \Gm@defbycnt can be used to define \Gm@xxxx variables by length and counter respectively with calc package.

\Gm@set@ratio

The macro parses the value of options specifying marginal ratios, which is used in \Gm@setbyratio macro.
\Gm@setbyratio\ The macro determines the dimension specified by \#4 calculating \#3\(\times\frac{a}{b}\), where \(a\) and \(b\) are given by \Gm@mratio with a \(b\) value. If \#1 in brackets is \(b\), \(a\) and \(b\) are swapped. The second argument with \(h\) or \(v\) denoting horizontal or vertical is not used in this macro.

144 \def\Gm@setbyratio[#1][#2][#3][#4]% determine \#6 by ratio
145 \expandafter\Gm@sep@ratio\Gm@mratio\relax
146 \if#1b
147 \edef\@@tempa\the\@tempcnta\%
148 \@tempcnta=\@tempcntb\%
149 \@tempcntb=\@@tempa\relax
150 \fi
151 \expandafter\setlength\expandafter\@tempdimb\expandafter
152 {\csname Gm@#3\endcsname}\
153 \ifnum\@tempcntb>\z@\%
154 \multiply\@tempdimb\@tempcnta\%
155 \divide\@tempdimb\@tempcntb\%
156 \fi
157 \edef\csname Gm@#4\endcsname{\the\@tempdimb}\
158 \@onlypreamble\Gm@setbyratio

\Gm@detiv\ This macro determines the fourth length(#4) from #1(paperwidth or paperheight), #2 and #3. It is used in \Gm@detall macro.

159 \def\Gm@detiv#1#2#3#4{% determine \#4.
160 \expandafter\setlength\expandafter\@tempdima\expandafter
161 {\csname paper#1\endcsname}\
162 \expandafter\setlength\expandafter\@tempdimb\expandafter
163 {\csname Gm@#2\endcsname}\
164 \addtolength\@tempdima{-\@tempdimb}\
165 \expandafter\setlength\expandafter\@tempdimb\expandafter
166 {\csname Gm@#3\endcsname}\
167 \addtolength\@tempdima{-\@tempdimb}\
168 \ifdim\@tempdima<\z@\%
169 \Gm@warning{\#4 results in NEGATIVE (\the\@tempdima) .%\n170 \spaces \#2 or \#3 should be shortened in length}\%
171 \fi
172 \edef\csname Gm@#4\endcsname{\the\@tempdima}\
173 \@onlypreamble\Gm@detiv

\Gm@detiiandiii\ This macro determines \#2 and \#3 from \#1 with the first argument (#1) can be width or height, which is expanded into dimensions of paper and total body. It is used in \Gm@detall macro.

174 \def\Gm@detiiandiii#1#2#3#4{% determine \#2 and \#3.
175 \expandafter\setlength\expandafter\@tempdima\expandafter
176 {\csname paper#1\endcsname}\
177 \expandafter\setlength\expandafter\@tempdimb\expandafter
178 {\csname Gm@#1\endcsname}\
179 \addtolength\@tempdima{-\@tempdimb}\
180 \ifdim\@tempdima<\z@\%
181 \Gm@warning{\#2 and \#3 result in NEGATIVE (\the\@tempdima) .%\n182 \spaces \#1 should be shortened in length}\%
183 \fi
184 \ifx\Gm@mratio\undefined
185 \divide\@tempdima\tw@\%
186 \@tempdimb=\@tempdima\%
187 \else
188 \@tempdimb=\@tempdima\%
189 \expandafter\setlength\expandafter\@tempdima\expandafter
190 {\csname Gm@#1\endcsname}\
191 \divide\@tempdima\@tempcntb\%
192 \divide\@tempdima\@tempcntb\%
193 \multiply\@tempdima\@tempcnta\%
194 \advance\@tempdimb-\@tempdima\%
195 \else
196 \divide\@tempdima\tw@\%
197 \@tempdimb=\@tempdima\%
\Gm@detall This macro determines partition of each direction. The first argument (#1) should be h or v, the second (#2) width or height, the third (#3) lmargin or top, and the last (#4) rmargin or bottom.

\Gm@clean The macro for setting unspecified dimensions to be \undefined. This is used by \geometry macro.
The macro parses (h,v)divide options.
\def\Gm@parse@divide#1#2#3#4{%
\let\Gm@star=*%
\@tempcnta\z@
\@for\Gm@tmp:=#1\do{% 
\KV@@sp@def\expandafter\Gm@frag{\Gm@tmp}%
\edef\Gm@value{\Gm@frag}%
\ifcase\@tempcntaelax% cnta == 0
\setkeys{Gm}{#2=\Gm@value}%
\or% cnta == 1
\setkeys{Gm}{#3=\Gm@value}%
\else\fi
\advance\@tempcnta\@one}%
\ifnum\@tempcnta=\@one
\setkeys{Gm}{#3=\Gm@value}%
\fi}
\@onlypreamble\Gm@parse@divide

The macro splits a value into the same two values.
\def\Gm@branch#1#2#3{%
\@tempcnta\z@
\@for\Gm@tmp:=#1\do{% 
\KV@@sp@def\Gm@frag{\Gm@tmp}%
\edef\Gm@value{\Gm@frag}%
\ifcase\@tempcntaelax% cnta == 0
\setkeys{Gm}{#2=\Gm@value}%
\or% cnta == 1
\setkeys{Gm}{#3=\Gm@value}%
\else\fi
\advance\@tempcnta\@one}%
\ifnum\@tempcnta=\@one
\setkeys{Gm}{#3=\Gm@value}%
\fi}
\@onlypreamble\Gm@branch

This macro is used to adjust offsets by \mag.
\def\Gm@magtooffset{%
\@tempdima=\mag\Gm@truedimen sp%
\@tempdimb=\Gm@truedimen in%
\divide\@tempdimb\@tempdima
\multiply\@tempdimb\@m
\addtolength{\hoffset}{\@tempdimb(1:\Gm@truedimen in)%}
This macro stores \LaTeX\ native dimensions, which are stored and set afterwards.

\Gm@setafter This macro stores \LaTeX\ native dimensions, which are stored and set afterwards.

\Gm@setafter#1#2{\let\Gm@len\relax\let\Gm@td\relax\edef\addtolist{\noexpand\Gm@dimlist={\the\Gm@dimlist \Gm@len{#1}{#2}}}\addtolist}\Gm@setafter

\Gm@processdimlist This macro processes \Gm@dimlist.

\Gm@processdimlist{\def\Gm@td{\Gm@truedimen}\def\Gm@len##1##2{\setlength{##1}{##2}}}\the\Gm@dimlist}\Gm@processdimlist

\Gm@setpaper The macro sets \texttt{paperwidth} and \texttt{paperheight} dimensions using \Gm@setafter macro.

\Gm@setpaper(#1,#2)#3{\let\Gm@td\relax\Gm@setafter\paperwidth{#1\Gm@td #3}\Gm@setafter\paperheight{#2\Gm@td #3}\ifGm@landscape\Gm@sworienttrue\else\Gm@sworientfalse\fi}\Gm@setpaper

\Gm@chpaper The macro changes the paper size.

\Gm@chpaper\@nameuse{Gm\Gm@paper}\Gm@chpaper

Various paper size are defined here.

\@namedef{Gm@a0paper}{\Gm@setpaper(841,1189){mm}}\@namedef{Gm@a1paper}{\Gm@setpaper(594,841){mm}}\@namedef{Gm@a2paper}{\Gm@setpaper(420,594){mm}}\@namedef{Gm@a3paper}{\Gm@setpaper(297,420){mm}}\@namedef{Gm@a4paper}{\Gm@setpaper(210,297){mm}}\@namedef{Gm@a5paper}{\Gm@setpaper(148,210){mm}}\@namedef{Gm@a6paper}{\Gm@setpaper(105,148){mm}}\@namedef{Gm@b0paper}{\Gm@setpaper(1000,1414){mm}}\@namedef{Gm@b1paper}{\Gm@setpaper(707,1000){mm}}\@namedef{Gm@b2paper}{\Gm@setpaper(500,707){mm}}\@namedef{Gm@b3paper}{\Gm@setpaper(353,500){mm}}\@namedef{Gm@b4paper}{\Gm@setpaper(250,353){mm}}\@namedef{Gm@b5paper}{\Gm@setpaper(176,250){mm}}\@namedef{Gm@b6paper}{\Gm@setpaper(125,176){mm}}\@namedef{Gm@ansiapaper}{\Gm@setpaper(8.5,11){in}}\@namedef{Gm@ansibpaper}{\Gm@setpaper(11,17){in}}\@namedef{Gm@ansicpaper}{\Gm@setpaper(17,22){in}}\@namedef{Gm@ansidpaper}{\Gm@setpaper(22,34){in}}\@namedef{Gm@ansilepaper}{\Gm@setpaper(34,44){in}}\@namedef{Gm@letterpaper}{\Gm@setpaper(8.5,11){in}}\@namedef{Gm@legalpaper}{\Gm@setpaper(8.5,14){in}}\@namedef{Gm@executivepaper}{\Gm@setpaper(7.25,10.5){in}}\@namedef{Gm@screen}{\Gm@setpaper(225,180){mm}}\Gm@screen

All the available options are defined below.

\begin{enumerate}
\item \texttt{paper} takes paper name as its value. Available paper names are listed below.
\item \texttt{a0paper}, \texttt{a1paper}, \texttt{a2paper}, \texttt{a3paper}, \texttt{a4paper}, \texttt{a5paper}, \texttt{a6paper}, \texttt{b0paper}, \texttt{b1paper}, \texttt{b2paper}, \texttt{b3paper}, \texttt{b4paper}, \texttt{b5paper}, \texttt{b6paper}, \texttt{ansiapaper}, \texttt{ansibpaper}, \texttt{ansicpaper}, \texttt{ansidpaper}, \texttt{ansilepaper}, \texttt{letterpaper}, \texttt{legalpaper}, \texttt{executivepaper}, \texttt{screen}
\end{enumerate}

The following paper names are available. \texttt{screen} and ANSI paper sizes have been introduced in ver.3, but of course they can’t be used as a documentclass option.
Direct specification for paper size is also possible.

Paper orientation setting is also available.

These options can determine the length(s) of total body giving scale(s) against the paper size.

These options give concrete dimension(s) of total body. totalwidth and totalheight are aliases of width and height respectively.

These options directly sets the dimensions \textwidth and \textheight. body is an alias of text.

The option sets \textheight with the number of lines.
'includehead'  include* options include the corresponding part(s) in total body.

'includefoot'

'includeheadfoot'

'includemp'

'includem'

'includem'

'includeall'

'includem'

'options include the corresponding part(s) in total body.

394 \define@key{Gm}{includehead}[true]{$\Gm@setbool{includehead}{#1}}\%
395 \define@key{Gm}{includefoot}[true]{$\Gm@setbool{includefoot}{#1}}\%
396 \define@key{Gm}{includeheadfoot}[true]{$\Gm@doifelse{includeheadfoot}{#1}\
397 {\Gm@includeheadtrue\Gm@includefoottrue}\
398 {\Gm@includeheadfalse\Gm@includefootfalse}}\%
399 \define@key{Gm}{includemp}[true]{$\Gm@setbool{includemp}{#1}}\%
400 \define@key{Gm}{includeall}[true]{$\Gm@doifelse{includeall}{#1}\
401 {\Gm@includeheadtrue\Gm@includefoottrue\Gm@includemptrue}\
402 {\Gm@includeheadfalse\Gm@includefootfalse\Gm@includempfalse}}\%

'ignorehead'

'ignorefoot'

'ignoreheadfoot'

'ignoremp'

'ignoreall'

'options disregard head, foot and marginpars in determining the location of total body.

403 \define@key{Gm}{ignorehead}[true]{$%\Gm@setboolrev[ignorehead]{includehead}{#1}}\%
404 \define@key{Gm}{ignorefoot}[true]{$%\Gm@setboolrev[ignorefoot]{includefoot}{#1}}\%
405 \define@key{Gm}{ignoreheadfoot}[true]{$\Gm@doifelse{ignoreheadfoot}{#1}\
406 {\Gm@includeheadfalse\Gm@includefootfalse}\
407 {\Gm@includeheadtrue\Gm@includefoottrue}}\%
408 \define@key{Gm}{ignoremp}[true]{$%\Gm@setboolrev[ignoremp]{includemp}{#1}}\%
409 \define@key{Gm}{ignoreall}[true]{$\Gm@doifelse{ignoreall}{#1}\
410 {\Gm@includeheadfalse\Gm@includefootfalse\Gm@includempfalse}\
411 {\Gm@includeheadtrue\Gm@includefoottrue\Gm@includemptrue}}\%

'heightrounded'
The option rounds \textheight to n-times of \baselineskip plus \topskip.

415 \define@key{Gm}{heightrounded}[true]{$%\Gm@setbool{heightrounded}{#1}}\%

'hdivide'
The options are useful to specify partitioning in each direction of the paper.

416 \define@key{Gm}{hdivide}{\Gm@parse@divide{#1}{lmargin}{width}{rmargin}}\%
417 \define@key{Gm}{vdivide}{\Gm@parse@divide{#1}{tmargin}{height}{bmargin}}\%
418 \define@key{Gm}{divide}{\Gm@parse@divide{#1}{lmargin}{width}{rmargin}\
419 \Gm@parse@divide{#1}{tmargin}{height}{bmargin}}\%

'lmargin'

'tmargin'

'margin'

'options set margins. left, inner, innermargin are aliases of lmargin. right, outer, outermargin are aliases of rmargin. top and bottom are aliases of tmargin and bmargin respectively.

420 \define@key{Gm}{lmargin}{\Gm@defbylen{lmargin}{#1}}\%
421 \define@key{Gm}{rmargin}{\Gm@defbylen{rmargin}{#1}}\%
422 \let\KV@Gm@left\KV@Gm@lmargin\%
423 \let\KV@Gm@inner\KV@Gm@lmargin\%
424 \let\KV@Gm@innermargin\KV@Gm@lmargin\%
425 \let\KV@Gm@right\KV@Gm@rmargin\%
426 \let\KV@Gm@outer\KV@Gm@rmargin\%
427 \let\KV@Gm@outermargin\KV@Gm@rmargin\%
428 \define@key{Gm}{tmargin}{\Gm@defbylen{tmargin}{#1}}\%
429 \define@key{Gm}{bmargin}{\Gm@defbylen{bmargin}{#1}}\%
430 \let\KV@Gm@top\KV@Gm@tmargin\%
431 \let\KV@Gm@bottom\KV@Gm@bmargin\%
432 \define@key{Gm}{hmargin}{\Gm@branch{#1}{lmargin}{rmargin}}\%
433 \define@key{Gm}{vmargin}{\Gm@branch{#1}{tmargin}{bmargin}}\%
434 \define@key{Gm}{margin}{\Gm@branch{#1}{hmarginratio}{vmarginratio}}\%

'hratio'

'vratio'

'hratio'

'options specifying the margin ratios.

436 \define@key{Gm}{hmarginratio}{\edef\Gm@hmarginratio{#1}}\%
437 \define@key{Gm}{vmarginratio}{\edef\Gm@vmarginratio{#1}}\%
438 \define@key{Gm}{marginratio}{\edef\Gm@marginratio{#1}{\Gm@hmarginratio}{\Gm@vmarginratio}}\%
439 \let\KV@Gm@hratio\KV@Gm@hmarginratio\%
440 \let\KV@Gm@vratio\KV@Gm@vmarginratio\%
441 \let\KV@Gm@ratio\KV@Gm@marginratio\%

26
Useful shorthands to make body centered.

\begin{verbatim}
\define@key{Gm}{hcentering}[true]{\Gm@doifelse{hcentering}{#1}{\def\Gm@hmarginratio{1:1}}}\%
\define@key{Gm}{vcentering}[true]{\Gm@doifelse{vcentering}{#1}{\def\Gm@vmarginratio{1:1}}}\%
\define@key{Gm}{centering}[true]{\Gm@doifelse{centering}{#1}{\def\Gm@hmarginratio{1:1}\def\Gm@vmarginratio{1:1}}}\%
\end{verbatim}

If \texttt{twoside=true}, \texttt{@twoside} and \texttt{@mparswitch} is set to \texttt{true}.

\begin{verbatim}
\define@key{Gm}{twoside}[true]{\Gm@doifelse{twoside}{#1}{\@twosidetrue\@mparswitchtrue}}\%
\end{verbatim}

\texttt{asymmetric} asymmetric sets \texttt{@mparswitchfalse} and \texttt{@twosidetrue}. \texttt{A asymmetric=false} has no effect.

\begin{verbatim}
\define@key{Gm}{asymmetric}[true]{\Gm@doifelse{asymmetric}{#1}{\@twosidetrue\@mparswitchfalse}}\%
\end{verbatim}

The macro specifies a white space added to the left or inner margin.

\begin{verbatim}
\define@key{Gm}{bindingoffset}{\Gm@setafter\Gm@bindingoffset{#1}}\%
\end{verbatim}

The direct settings of \texttt{head} and/or \texttt{foot} dimensions.

\begin{verbatim}
\define@key{Gm}{headheight}{\Gm@setafter\headheight{#1}}\%
\define@key{Gm}{headsep}{\Gm@setafter\headsep{#1}}\%
\define@key{Gm}{footskip}{\Gm@setafter\footskip{#1}}\%
\end{verbatim}

They are only shorthands to set \texttt{head} and/or \texttt{foot} to be \texttt{0pt}.

\begin{verbatim}
\define@key{Gm}{nohead}
\define@key{Gm}{nofoot}
\define@key{Gm}{noheadfoot}{\Gm@setafter\headheight\z@\Gm@setafter\headsep\z@\Gm@setafter\footskip\z@}{}}\%
\end{verbatim}

The option directly sets a native dimension \texttt{footnotesep}.

\begin{verbatim}
\define@key{Gm}{footnotesep}{\Gm@setafter\skip\footins{#1}}\%
\end{verbatim}

They directly set native dimensions \texttt{marginparwidth} and \texttt{marginparsep}. For compatibility, \texttt{includeemp} is set to \texttt{true} if \texttt{compat2} is set.

\begin{verbatim}
\define@key{Gm}{marginparwidth}{\ifGm@compatii\Gm@includemptrue\fi\Gm@setafter\marginparwidth{#1}}\%
\define@key{Gm}{marginparsep}{\ifGm@compatii\Gm@includemptrue\fi\Gm@setafter\marginparsep{#1}}\%
\end{verbatim}

The macro is a shorthand for \texttt{marginparwidth=0pt} and \texttt{marginparsep=0pt}.

\begin{verbatim}
\define@key{Gm}{nomarginpar}{\Gm@setafter\marginparwidth\z@\Gm@setafter\marginparsep\z@}{}}\%
\end{verbatim}

The option sets a native dimension \texttt{columnsep}.

\begin{verbatim}
\define@key{Gm}{columnsep}{\Gm@setafter\columnsep{#1}}\%
\end{verbatim}

The former two options set native dimensions \texttt{hoffset} and \texttt{voffset}. \texttt{offset} can set both of them with the same value.

\begin{verbatim}
\define@key{Gm}{hoffset}{\Gm@setafter\hoffset{#1}}\%
\define@key{Gm}{voffset}{\Gm@setafter\voffset{#1}}\%
\define@key{Gm}{offset}{\Gm@branch{#1}{\hoffset}{\voffset}}\%
\end{verbatim}

The option sets \texttt{twocolumn} switch.

\begin{verbatim}
\define@key{Gm}{twocolumn}{true}{\Gm@doif\twocolumn{#1}{\csname @twocolumn\Gm@bool\endcsname}}\%
\end{verbatim}
The geometry package supports dvips, dvipdfm, pdftex and vtex. dvipdfm works like dvips.

The both options set \reversemargin.

The verbose mode.

The option cancels all the options specified before reset, except pass. mag (≠ 1000) with truedimen cannot be also reset.

If resetpaper is set to true, the paper size redefined in the package is discarded and the original one is restored. This option may be useful to print nonstandard sized documents with normal printers and papers.

'mag' mag is expanded immediately when it is specified. So reset can't reset mag when it is set with truedimen.

If truedimen is set to true, all of the internal explicit dimensions is changed to true dimensions, e.g., 1in is changed to 1truein.

The option makes all the options specified ineffective except verbose switch.

The showframe option.

The option sets the old default options for compatibility with version 2. compat2=false does nothing.

Option twosideshift has been obsoleted. But for compatibility with version 2, one can use twosideshift when compat2 is set to true.
The macro stores paper dimensions. This macro should be called after \ProcessOptionsKV{Gm}.

\def\Gm@setdefaultpaper{%
  \ifx\Gm@paper\undefined
    \Gm@setpaper(strip\strip\paperwidth,strip\strip\paperheight){pt}%
  \Gm@sworientfalse
  \fi
}
\@onlypreamble\Gm@setdefaultpaper

The macro checks if paperwidth/height is larger than 0pt, which is used in \Gm@process.

\def\Gm@checkpaper{%
  \ifdim\paperwidth<p0\else
    \PackageError{geometry}{You must set \string\paperwidth\space properly}{Set your paper type (e.g., ‘a4paper’ for A4) as a class option^^J or as a geometry package option.}%
  \fi
  \ifdim\paperheight>p0\else
    \PackageError{geometry}{You must set \string\paperheight\space properly}{Set your paper type (e.g., ‘a4paper’ for A4) as a class option^^J or as a geometry package option.}%
  \fi
}
\@onlypreamble\Gm@checkpaper

The macro checks if marginpars fall off the page.

\def\Gm@checkmp{%
  \ifGm@includemp\else
    \@tempcnta\z@\@tempcntb\@ne
    \if@twocolumn
      \@tempcnta\@ne
    \else
      \if@reversemargin
        \@tempcnta\@ne\@tempcntb\z@
      \fi
    \fi
    \@tempdima\marginparwidth
    \advance\@tempdima\marginparsep
    \ifnum\@tempcnta=\@ne
      \@tempdimc\@tempdima
      \setlength\@tempdimb{\Gm@lmargin}\@spaces Add \the\@tempdimc space and more to the left margin}%
    \fi
    \ifnum\@tempcntb=\@ne
      \@tempdimc\@tempdima
      \setlength\@tempdimb{\Gm@rmargin}\@spaces Add \the\@tempdimc space and more to the right margin}%
    \fi
  \fi
}
\@onlypreamble\Gm@checkmp

The macro checks the typeset environment and changes the driver option if necessary. To make the engine detection more robust, the macro is rewritten in version 4 with packages ifpdf and ifvtex.

\def\Gm@checkdrivers{%
  \ifx\Gm@driver\@empty
    \typeout{*geometry auto-detecting driver*}%
  \fi
}
\@onlypreamble\Gm@checkdrivers
\ifpdf is defined in \texttt{ifpdf} package in ‘oberdiek’ bundle.
\begin{verbatim}
\ifpdf
  \Gm@setdriver{pdftex}\
\else
  \Gm@setdriver{dvips}\
\fi
\fi
\end{verbatim}

Xe\TeX\ supports the same page size parameter as pdf\TeX.\begin{verbatim}
\@ifundefined{XeTeXrevision}{}{\Gm@setdriver{pdftex}}%\end{verbatim}
\ifvtex
is defined in \texttt{ifvtex} package in ‘oberdiek’ bundle.
\begin{verbatim}
\ifvtex
  \Gm@setdriver{vtex}\
\fi
\end{verbatim}

When the driver option is set by the user, check if it is valid or not.
\begin{verbatim}
\else
  \ifx\Gm@driver\Gm@pdftex
    \ifpdf\else
      \@ifundefined{XeTeXrevision}{\Gm@warning{Wrong driver setting: ‘pdftex’; using default driver}}{\Gm@setdriver{dvips}}\fi
    \fi
  \fi
\fi\end{verbatim}

The macro sets marginpar correction when \texttt{includemp} is set, which is used in \texttt{\Gm@process}. Local variables \texttt{\Gm@wd@mp}, \texttt{\Gm@odd@mp} and \texttt{\Gm@even@mp} are set here. Note that \texttt{\Gm@even@mp} should be used only for twoside layout.
\begin{verbatim}
\def\Gm@mpfix{%
  \@tempdimb\marginparwidth
  \advance\@tempdimb\marginparsep
  \Gm@wd@mp\@tempdimb
  \Gm@odd@mp\z@\Gm@even@mp\z@
  \if@twocolumn
    \Gm@wd@mp2\@tempdimb
    \Gm@odd@mp\@tempdimb
    \Gm@even@mp\@tempdimb
  \else
    \if@reversemargin
      \Gm@odd@mp\@tempdimb
      \if@mparswitch\else
        \Gm@even@mp\@tempdimb
      \fi
    \else
      \if@mparswitch
        \Gm@even@mp\@tempdimb
      \fi
    \fi
  \fi
  \fi\end{verbatim}

The main macro processing specified layout dimensions is defined.
\begin{verbatim}
\def\Gm@process{%
  If \texttt{pass} is set, the original dimensions and switches are restored and process is ended here.
\ifGm@pass
\fi\end{verbatim}
The stored native dimension settings are processed here.

The margin ratios are set to the default if not specified.

The paper size is checked here.

The paper dimensions can be swapped when paper orientation is changed over by `landscape` and `portrait` options.

The bindingoffset value is removed from the paper width, which will be set back after auto-completion calculation.

If the horizontal dimension of `body` is specified by user, \texttt{\Gm@width} is set properly here.

If the vertical dimension of `body` is specified by user, \texttt{\Gm@height} is set properly here.
\textskip has to be adjusted so that the formula \texttt{\textwidth = (lines - 1) \times \baselineskip + \textskip} to be correct even if large font sizes are specified by users. If \textskip is smaller than \textwidth, then \textskip is set to \textwidth. 

\begin{verbatim}
\ifdim\topskip<\ht\strutbox
\setlength\@tempdima{\topskip}\
\setlength\topskip{\ht\strutbox}\
\Gm@warning{\noexpand\topskip was changed from \the\@tempdima to \the\topskip}\
\fi
\setlength\@tempdima{\baselineskip}\
\multiply\@tempdima\Gm@lines\
\addtolength\@tempdima{\topskip}\
\addtolength\@tempdima{-\baselineskip}\
\edef\Gm@textheight{\the\@tempdima}\
\fi
\ifx\Gm@textheight\@undefined\else
\setlength\@tempdima{\Gm@textheight}\
\ifGm@includehead
\addtolength\@tempdima{\headheight}\
\addtolength\@tempdima{\headsep}\
\fi
\ifGm@includefoot
\addtolength\@tempdima{\footskip}\
\fi
\edef\Gm@height{\the\@tempdima}\
\fi
\fi

The auto-completion calculation is executed for each direction.
\Gm@detaill{h}{width}{lmargin}{rmargin}\
\Gm@detaill{v}{height}{tmargin}{bmargin}\
The real dimensions are set properly according to the result of the auto-completion calculation.
\setlength\textwidth{\Gm@width}\
\setlength\textheight{\Gm@height}\
\setlength\topmargin{\Gm@tmargin}\
\setlength\oddsidemargin{\Gm@lmargin}\
\addtolength\oddsidemargin{-1\Gm@truedimen in}\
\setlength\evensidemargin{\Gm@rmargin}\
\addtolength\evensidemargin{-1\Gm@truedimen in}\
\if@mparswitch
\setlength\evensidemargin{\Gm@rmargin}\
\addtolength\evensidemargin{-1\Gm@truedimen in}\
\fi
\ifGm@includemp
\advance\textwidth-\Gm@wd@mp\
\advance\oddsidemargin\Gm@odd@mp\
\fi
\ifGm@compatii
\ifx\Gm@twosideshift\@undefined
\def\Gm@twosideshift{20\Gm@truedimen pt}\
\fi
\addtolength\oddsidemargin{\Gm@twosideshift}\
\addtolength\evensidemargin{-\Gm@twosideshift}\
\fi
\else
\evensidemargin\oddsidemargin\
\fi
\end{verbatim}

Determining \texttt{\evensidemargin}. In the twoside page layout, the right margin value \texttt{\Gm@rmargin} is used. If the marginal note width is included, \texttt{\evensidemargin} should be corrected by \texttt{\Gm@even@mp}. 

\begin{verbatim}
\if@mparswitch
\setlength\evensidemargin{\Gm@rmargin}\
\addtolength\evensidemargin{-1\Gm@truedimen in}\
\fi
\ifGm@includemp
\advance\evensidemargin\Gm@even@mp\
\fi
\ifGm@compatii
\ifx\Gm@twosideshift\@undefined
\def\Gm@twosideshift{20\Gm@truedimen pt}\
\fi
\addtolength\evensidemargin{\Gm@twosideshift}\
\addtolength\evensidemargin{-\Gm@twosideshift}\
\fi
\else
\evensidemargin\oddsidemargin\
\fi
\end{verbatim}
The bindingoffset correction for \oddsidemargin.
\advance \oddsidemargin \Gm@bindingoffset
\topmargin is adjusted here.
\addtolength \topmargin {-1 \Gm@truedimen in}\
If the head of the page is included in total body, \headheight and \headsep are removed from \textheight, otherwise from \topmargin.
\ifGm@includehead
\addtolength \textheight {-\headheight}\
\addtolength \textheight {-\headsep}\
\else
\addtolength \topmargin {-\headheight}\
\addtolength \topmargin {-\headsep}\
\fi
If the foot of the page is included in total body, \footskip is removed from \textheight.
\ifGm@includefoot
\addtolength \textheight {-\footskip}\
\fi
If heightrounded is set, \textheight is rounded.
\ifGm@heightrounded
\setlength \@tempdima {\textheight}\
\addtolength \@tempdima {-\topskip}\
@tempcnta \@tempdima\
@tempcntb \baselineskip\
\divide @tempcnta @tempcntb\
\setlength \@tempdimb \baselineskip\
\multiply \@tempdimb @tempcnta\
\advance \@tempdima -\@tempdimb\
\multiply \@tempdima \tw@\
\ifdim \@tempdima >\baselineskip\
\addtolength \@tempdimb \baselineskip\
\fi\
\addtolength \@tempdimb \topskip\
\textheight \@tempdimb\
\fi
The paper width is set back by adding \Gm@bindingoffset.
\addtolength \paperwidth {\Gm@bindingoffset}\
\@onlypreamble \Gm@process
\Gm@showparam The macro for typeout of geometry status and native dimensions for page layout.
\def \Gm@showparams {\
-------------------- Geometry parameters^^J\%\
\ifGm@pass 'pass' is specified!! (disables the geometry layouter)^^J\%\
\else
\paper: if\Gm@paper\undefined class default\else \Gm@paper\fi\"\%\
\else
\multicolumn: if\twocolumn\Gm@true\else --\fi\"\%\
\twoside: if\twoside\Gm@true\else --\fi\"\%\
\asymmetric: if\asymmetricSwitch --\else if\twoside\Gm@true\else --\fi\"\%\
\h-parts: \Gm@lmargin, \Gm@width, \Gm@rmargin\%\
\ifnum \Gm@cnth = 0\space (default)\fi\"\%\
\v-parts: \Gm@tmargin, \Gm@height, \Gm@bmargin\%\
\ifnum \Gm@cntv = 0\space (default)\fi\"\%\
\hmarginratio: if\Gm@cnth<5 \if\Gm@cnth=3--\else\fi\"\%\
\vmarginratio: if\Gm@cntv<5 \if\Gm@cntv=3--\else\fi\"\%\
\hmarginratio \Gm@marginratio \fi\else --\fi\"\%\
\vmarginratio \Gm@marginratio \fi\else --\fi\"\%\
\lines: if\undefined{Gm@lines}{---}{\Gm@lines}\"\%\
\Gm@checkbool{heightrounded}\%\}
This macro can process class and package options using ‘key=value’ scheme. Only class options are processed with an optional argument ‘c’, package options with ‘p’, and both of them by default.

\ProcessOptionsKV\def\ProcessOptionsKV\def\ProcessOptionsKV}[c]{Gm} Paper dimensions given by class default are stored.

\Gm@init can be called by reset or pass options.
\Gm@init

The optional arguments to \documentclass are processed here.
\ProcessOptionsKV[c]{Gm} Paper dimensions given by class default are stored.
\Gm@setdefaultpaper
\Gm@setkey \ExecuteOptions is replaced with \Gm@setkey to make it possible to deal with \texttt{'(key)=(value)'} as its argument.

A local configuration file may define more options. To set A4 paper as default, \texttt{geometry.cfg} gg to contain \texttt{\ExecuteOptions{a4paper}}.

The original definition for \ExecuteOptions macro is restored.

The optional arguments to \usepackage are processed here.

Actual settings and calculation for layout dimensions are processed.

If \texttt{pass} is set to \texttt{true}, no adjustment for page dimensions is done.

Checking the driver options.

If \texttt{pdftex} is set to \texttt{true}, pdf-commands are set properly. To avoid \texttt{pdftex} magnification problem, \texttt{\pdfhorigin} and \texttt{\pdfvorigin} are adjusted for \texttt{\mag}.

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With VTeX environment, VTeX variables are set here.

```tex
\ifx\Gm@driver\Gm@vtex
  \mediawidth=\paperwidth
  \mediaheight=\paperheight
  \ifvtexdvi
    \AtBeginDvi{\special{papersize=the\paperwidth,\the\paperheight}}%
  \fi
\fi
```

If `dvips` or `dvipdfm` is set to `true`, paper size is embedded in dvi file with `\special`. For dvips, a landscape correction is added because a landscape document converted by dvips is upside-down in PostScript viewers.

```tex
\ifx\Gm@driver\Gm@dvips
  \AtBeginDvi{\special{papersize=the\paperwidth,\the\paperheight}}%
  \ifx\Gm@driver\Gm@dvips\ifGm@landscape
    \AtBeginDvi{\special{! /landplus90 true store}}%
  \fi\fi
\else
  \AtBeginShipoutFirst{\special{papersize=the\paperwidth,\the\paperheight}}%
  \or
  \AtBeginDvi{\special{papersize=the\paperwidth,\the\paperheight}}%
\fi
```

If `showframe=true`, page frames and lines are showed on the first page.

```tex
\ifGm@showframe
  \AtBeginDvi{%
    \movertop{\@themargin]%
    \vbox to\z@{
      \baselineskip\z@skip
      \lineskip\z@skip
      \lineskiplimit\z@%
      \vskip\topmargin
      \vbox to\z@{
        \vss
        \hrule width\textwidth}%
      \vbox to\z@{
        \vbox to\z@{
          \vss
          \hrule width\paperwidth}
        \hbox to\paperwidth{
          \vrule height\paperheight}
        \vrule height\paperheight}
      \vbox to\z@{
        \vss
        \hrule width\paperwidth}
      \hbox to\paperwidth{
        \vrule height\paperheight}
      \vrule height\paperheight}
    \vbox to\z@{
      \vss
      \hrule width\textwidth}
    \vbox to\z@{
      \vss
      \hrule width\textwidth}%
  }
\}
```

If `verbose=true and pass=false`, the system checks if marginpars fall off the page.

```tex
\ifGm@verbose\ifGm@pass\else\Gm@checkmp\fi\fi
```

If `verbose=true` the parameter results are displayed on the terminal. `verbose=false` (default) still puts them into the log file.

```tex
\ifGm@verbose\expandafter\typeout\else\expandafter\wlog\fi
```

save memory.

```tex
\let\Gm@cntv\relax
\let\Gm@tempcnt\relax
\let\Gm@bindingoffset\relax
```

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The user-interface macro \geometry is defined here. This command should be used in the preamble.

\def\geometry#1{\Gm@clean \setkeys{Gm}{#1} \Gm@process}
\@onlypreamble\geometry

13 Config file

In the configuration file geometry.cfg, one can use \ExecuteOptions to set the site or user default settings.

% Uncomment and edit the line below to set default options.
% \ExecuteOptions{a4paper}

14 Sample file

Here is an executable sample tex file.
\begin{document}
\manyfoxes\manyfoxes\manyfoxes\manyfoxes
\manyfoxes\manyfoxes\manyfoxes\manyfoxes
\manyfoxes\manyfoxes\manyfoxes\manyfoxes
\end{document}