The **fgruler** package

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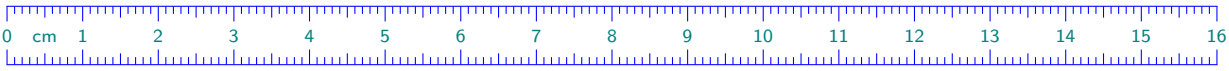


1 Introduction

The `fgruler` package draws horizontal and vertical rulers on the foreground of every (or the current) page at absolute position. In this way, you can check the page layout dimensions. You can also draw various rulers in the text.

The `fgruler` package requires the services of the following packages: `kvoptions`, `etoolbox`, `xcolor`, `graphicx`, `eso-pic`.

2 Loading package

Load the package with

```
\usepackage[⟨package options⟩]{fgruler}
```

or

```
\usepackage{fgruler}
\setfgruler{⟨package options⟩}
```

The `\setfgruler` command is usable in the document body, too.

3 Package options

By default, the `fgruler` package draws a square ruler on the foreground of every page. The following package options set the parameters of these rulers.

`unit=`⟨*unit*⟩
: Ruler unit. Possible ⟨*unit*⟩ values:

  `cm` Metric ruler (centimeter). Default value.

  `in` English ruler (inch).

`type=`⟨*type name*⟩
: It determines the origin, directions, and lengths of the ruler. Possible ⟨*type name*⟩ values:

  `upperleft` Default value. Square ruler (origin: upper left corner of the paper; directions: down and right; lengths: paper sizes). See Example 7.1.

  `upperright` Square ruler (origin: upper right corner of the paper; directions: down and left; lengths: paper sizes). See Example 7.3.

  `lowerleft` Square ruler (origin: lower left corner of the paper; directions: up and right; lengths: paper sizes). See Example 7.4.

  `lowerright` Square ruler (origin: lower right corner of the paper; directions: up and left; lengths: paper sizes). See Example 7.5.

`upperleftT` Square ruler (origin: upper left corner of the text area; directions: down and right; lengths: text area sizes). See Example 7.12.

`upperrightT` Square ruler (origin: upper right corner of the text area; directions: down and left; lengths: text area sizes). See Example 7.13.

`lowerleftT` Square ruler (origin: lower left corner of the text area; directions: up and right; lengths: text area sizes). See Example 7.14.

`lowerrightT` Square ruler (origin: lower right corner of the text area; directions: up and left; lengths: text area sizes). See Example 7.15.

`alledges` There are rulers on all edges of the paper. Top ruler origin: upper left corner of the paper (direction: right). Bottom ruler origin: lower left corner of the paper (direction: right). Left ruler origin: upper left corner of the paper (direction: down). Right ruler origin: upper right corner of the paper (direction: down). Lengths: paper sizes. See Example 7.10.

`alledges*` It is similar to `alledges` option, but bottom ruler origin is lower right corner of the paper (direction: left), and left ruler origin is lower left corner of the paper (direction: up). See Example 7.11.

`alledgesT` It is similar to `alledges` option, but on the edges of the text area. See Example 7.16.

`alledgesT*` It is similar to `alledges*` option, but on the edges of the text area. See Example 7.17.

`user` Each ⟨*unit*⟩–⟨*type name*⟩ pair activates an `\fgrulertype{`⟨*unit*⟩`}{`⟨*type name*⟩`}` command. So the expansion of `\fgrulertype{`⟨*unit*⟩`}{user}` determines the effect of this option. It will be ⟨*code*⟩ after using the `\fgrulerdefuser{`⟨*code*⟩`}` command, where in the ⟨*code*⟩ you have to referrence the unit as `\fgrulerunit`. For example, after
`\fgrulerdefuser{\fgrulertype{\fgrulerunit}{alledges}}`
the `type=user` option will be equivalent to the `type=alledges`. See also Examples 7.19–7.22.

`none` No ruler drawn.

`type={`⟨*type name list*⟩`}`
The ⟨*type name list*⟩ is a list of valid type names separated by commas. These types will be combined. For example `type={alledges,alledgesT}`. See the result in Example 7.18.

`hshift=`⟨*length*⟩
Horizontal shift of the ruler, if the ⟨*type name*⟩ is `upperleft`, `lowerleft`, `upperright`, or `lowerright`. The shift direction is right, if the ⟨*type name*⟩ is `upperleft` or `lowerleft`. The shift direction is left, if the ⟨*type name*⟩ is `upperright` or `lowerright`. Default: `hshift=0cm`. See Examples 7.6–7.9.

`vshift=`⟨*length*⟩
Vertical shift of the ruler, if the ⟨*type name*⟩ is `upperleft`, `lowerleft`, `upperright`, or `lowerright`. The shift direction is down, if the ⟨*type name*⟩ is `upperleft` or `upperright`. The shift direction is up, if the ⟨*type name*⟩ is `lowerleft` or `lowerright`. Default: `vshift=0cm`. See Examples 7.6–7.9.

`color=`⟨*color name*⟩
Ruler color (see `xcolor` package). Default: `color=black`. See Example 7.2.

`numsep=`⟨*length*⟩
Separation between number and ruler. Default: `numsep=3pt`.

`markthick=`⟨*length*⟩
Mark thickness. Default: `markthick=0.4pt`.

`marklength=`⟨*length*⟩
Mark length at integer units (see the red marks): 

Default: `marklength=2mm`. See the length of the other marks in Section 6.

`numfont=`⟨*font type*⟩
Number font type. Default: `numfont=\scriptsize\sffamily`. You can use this option only in `\setfgruler` and `\fgruler*` (see Section 4) commands.

showframe or showframe=true
: It draws visible frames for the text and margin area, and lines for the head and foot. Their color and thickness are determined by the `color` and the `markthick` options. See Example 7.2.

showframe=false
: It deactivates the `showframe` option.

nonefgrulers
: It kills all of the rulers on the foreground, including also those, which are generated by `\fgruler` or `\fgruler*` (see Section 4). But the rulers, which were drawn by `\ruler` and `\squareruler` (see Section 5), do not disappear. Furthermore it deactivates the `showframe` option, too. In this case the `fgruler` package does not load the `eso-pic` package. This option works only in preamble.

  It is recommended to use in two cases:

  - To draw rulers only in text, there is no need for the checking function.
  - To halt the checking function temporarily.

  The `type=none` is not identical with `nonefgrulers` option. The differences:

  - `type=none` does not kill the `\fgruler` and `\fgruler*` commands and the `showframe` option.
  - `type=none` is alterable in any point of the document.
  - The `fgruler` package loads the `eso-pic` package, if you use the `type=none` option without `nonefgrulers`.

4 Drawing rulers on the foreground of the current page

`\fgruler[`⟨*unit*⟩`]{`⟨*type name*⟩`}{`⟨*hshift*⟩`}{`⟨*vshift*⟩`}`
: It draws a square ruler on the foreground of that page, where this command is expanded. You can use more `\fgruler` commands in the same page.

  The package options (see Section 3) also work on this command, except for `type`, `hshift`, and `vshift`.

  This command is effectless, if you use the `nonefgrulers` package option in the preamble.

  ⟨*unit*⟩ options: `cm`, `in` (see Section 3). Its default value is the same as the value specified by the `unit=`⟨*unit*⟩ package option.

  ⟨*type name*⟩ parameters: `upperleft`, `upperright`, `lowerleft`, `lowerright` (see Section 3).

  ⟨*hshift*⟩ Horizontal shift. The shift direction is right, if the ⟨*type name*⟩ is `upperleft` or `lowerleft`, otherwise left.

  ⟨*vshift*⟩ Vertical shift. The shift direction is down, if the ⟨*type name*⟩ is `upperleft` or `upperright`, otherwise up.

  Example: `\fgruler[in]{upperright}{1in}{2.5in}`

`\fgruler*[`⟨*package options*⟩`]{`⟨*type name*⟩`}`
: It draws a ruler on the foreground of that page, where this command is expanded. You can use more `\fgruler*` commands in the same page.

  The package options (see Section 3) also work on this command, except for `type`.

  This command is effectless, if you use the `nonefgrulers` package option in the preamble.

  ⟨*package options*⟩ All options from Section 3, except for `type`, `showframe`, and `nonefgrulers`.

  ⟨*type name*⟩ All possible values of the `type` option from Section 3, except for the `none` value.

  Example: `\fgruler*[color=red,type=in]{alledges}`

  Note that the following two commands are equivalent:
  `\fgruler*[unit=in,hshift=1in,vshift=2.5in]{upperright}`
  `\fgruler[in]{upperright}{1in}{2.5in}`

5 Drawing rulers in the text

`\ruler[`⟨*unit*⟩`]{`⟨*type name*⟩`}{`⟨*length*⟩`}`

It draws a horizontal or a vertical ruler. The bottom of the ruler is aligned to the baseline of the surrounding text. The package options (see Section 3) do not work on this command.

⟨*unit*⟩ options:

`cm` Metric ruler (centimeter). Default option.
`in` English ruler (inch).

⟨*type name*⟩ parameters:

`downright`	Direction: down. The numbers are on the right side.
`downleft`	Direction: down. The numbers are on the left side.
`upright`	Direction: up. The numbers are on the right side.
`upleft`	Direction: up. The numbers are on the left side.
`rightdown`	Direction: right. The numbers are on the down side.
`rightup`	Direction: right. The numbers are on the up side.
`leftdown`	Direction: left. The numbers are on the down side.
`leftup`	Direction: left. The numbers are on the up side.
`taperight`	Tape measure (direction: right). See Example 7.25.
`tapeleft`	Tape measure (direction: left). See Example 7.25.

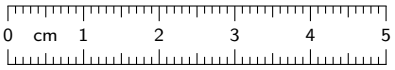
⟨*length*⟩ Ruler length.

Example: `\ruler{rightdown}{5cm}`

`\ruler*[`⟨*unit*⟩`]{`⟨*type name*⟩`}{`⟨*length*⟩`}`

It works like `\ruler`, but the top of the ruler is aligned to the baseline of the surrounding text.

Example: `\ruler*{taperight}{5cm}`



`\squareruler[`⟨*unit*⟩`]{`⟨*type name*⟩`}{`⟨*width*⟩`}{`⟨*height*⟩`}`

It draws a square ruler. The bottom of the square ruler is aligned to the baseline of the surrounding text. The package options (see Section 3) do not work on this command.

⟨*unit*⟩ options:

`cm` Metric ruler (centimeter). Default option.
`in` English ruler (inch).

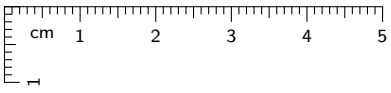
⟨*type name*⟩ parameters:

`upperleft`	Directions: down and right.
`upperright`	Directions: down and left.
`lowerleft`	Directions: up and right.
`lowerright`	Directions: up and left.

⟨*width*⟩ Square ruler width.

⟨*height*⟩ Square ruler height.

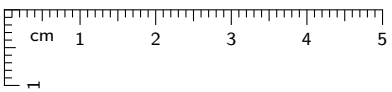
Example: `\squareruler{upperleft}{5cm}{1cm}`



`\squareruler*[`⟨*unit*⟩`]{`⟨*type name*⟩`}{`⟨*width*⟩`}{`⟨*height*⟩`}`

It works like `\squareruler`, but the top of the square ruler is aligned to the baseline of the surrounding text.

Example: `\squareruler*{upperleft}{5cm}{1cm}`



`\rulerparams{`⟨*markthick*⟩`}{`⟨*numfont*⟩`}{`⟨*color*⟩`}{`⟨*marklength*⟩`}{`⟨*numsep*⟩`}`

It sets the parameters of the rulers, which are drawn by `\ruler` or `\squareruler`. If an argument is empty, then that parameter will not be changed.

⟨*markthick*⟩ Mark thickness. Default: `0.4pt`

⟨*numfont*⟩ Number font type. Default: `\scriptsize\sffamily`

⟨*color*⟩ Ruler line color. Default: `black`

⟨*marklength*⟩ Mark length at integer units. Default: `2mm`

⟨*numsep*⟩ Separation between number and ruler. Default: `3pt`

For example, `\rulerparams{}{}{red}{}{}` changes the ruler color to red.

`\rulerparamsfromfg`
It sets the ruler parameters from the current foreground ruler parameters.

`\rulernorotatenum`
By default, the numbers of the vertical rulers (which were generated by `\ruler` or `\squareruler`) are rotated by 90°. It kills this action. This command can only be expanded in the document body.

Example: `{\rulernorotatenum\ruler{upright}{1cm}}`

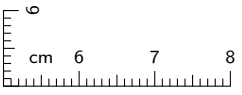
`\rulerrotatenum`
After `\rulernorotatenum`, it reactivates the number rotating. This command can only be expanded in the document body.

6 Additional setting commands

The following commands can work on all of the rulers, which are drawn by `fgruler` package.

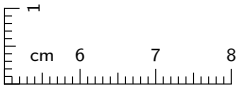
`\fgrulerstartnum{`⟨*num*⟩`}`
The ⟨*num*⟩ is a nonnegative integer, which will be the starting number on the horizontal and vertical rulers. Default: `\fgrulerstartnum{0}`

Example: `{\fgrulerstartnum{5}\squareruler{lowerleft}{3cm}{1cm}}`



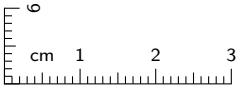
`\fgrulerstartnumh{`⟨*num*⟩`}`
The ⟨*num*⟩ is a nonnegative integer, which will be the starting number on the horizontal rulers. Default: `\fgrulerstartnumh{0}`

Example: `{\fgrulerstartnumh{5}\squareruler{lowerleft}{3cm}{1cm}}`



`\fgrulerstartnumv{`⟨*num*⟩`}`
The ⟨*num*⟩ is a nonnegative integer, which will be the starting number on the vertical rulers. Default: `\fgrulerstartnumv{0}`

Example: `{\fgrulerstartnumv{5}\squareruler{lowerleft}{3cm}{1cm}}`



`\fgrulernoborderline`
By default, there is a borderline on one side of the ruler. It disappears by this command.

Example: `{\fgrulernoborderline\ruler{rightup}{3cm}}`

`\fgrulerborderline`
After `\fgrulernoborderline`, it reactivates the previous default effect.

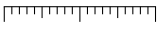
`\fgrulercaptioncm{`⟨*caption*⟩`}`
Unit caption in metric ruler. Default: `\fgrulercaptioncm{cm}`

Example: `{\fgrulercaptioncm{}\ruler{rightup}{3cm}}`

`\fgrulercaptionin{`⟨*caption*⟩`}`
Unit caption in English ruler. Default: `\fgrulercaptionin{inch}`

`\fgrulerdefnum{`⟨*definition*⟩`}`

The ruler numbers are determined by the `fgrulernum` counter. Its current value is printed by the `\thefgrulernum`. Its default definition is `\def\thefgrulernum{\arabic{fgrulernum}}`, which is equivalent to `\fgrulerdefnum{\arabic{fgrulernum}}`.

Example: `{\fgrulerdefnum{}\fgrulercaptioncm{}\ruler{rightdown}{2cm}}` 

`\fgrulerratiocm{`⟨*ratio1*⟩`}{`⟨*ratio2*⟩`}`

Mark length ratios in metric rulers. If an argument is empty, then that parameter will not be changed.

⟨*ratio1*⟩ Mark length ratio at $k/10$ cm, where k is positive integer and not divisible by 5.

For example, if this ratio is 0.5 and the mark length at integer unit is 2 mm, then this mark length will be $0.5 \cdot 2\,\text{mm} = 1\,\text{mm}$.

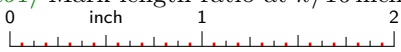
⟨*ratio2*⟩ Mark length ratio at $k/2$ cm, where k is positive odd integer.

Default: `\fgrulerratiocm{0.5}{0.75}`

`\fgrulerratioin{`⟨*ratio1*⟩`}{`⟨*ratio2*⟩`}{`⟨*ratio3*⟩`}{`⟨*ratio4*⟩`}`

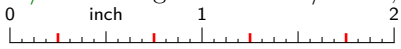
Mark length ratios in English rulers. If an argument is empty, then that parameter will not be changed.

⟨*ratio1*⟩ Mark length ratio at $k/16$ inch, where k is positive odd integer.

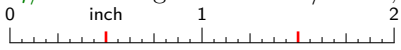


⟨*ratio2*⟩ Mark length ratio at $k/8$ inch, where k is positive odd integer.

⟨*ratio3*⟩ Mark length ratio at $k/4$ inch, where k is positive odd integer.



⟨*ratio4*⟩ Mark length ratio at $k/2$ inch, where k is positive odd integer.



Default: `\fgrulerratioin{0.25}{0.375}{0.625}{0.75}`

`\fgrulerthickcm{`⟨*thick1*⟩`}{`⟨*thick2*⟩`}{`⟨*thick3*⟩`}`

Mark thicknesses in metric rulers. If an argument is empty, then that parameter will not be changed.

⟨*thick1*⟩ Mark thickness at $k/10$ cm, where k is positive integer and not divisible by 5.

⟨*thick2*⟩ Mark thickness at $k/2$ cm, where k is positive odd integer.

⟨*thick3*⟩ Mark thickness at integer units.

The default values are given by ⟨*markthick*⟩ of `\rulerparams`, respectively by `markthick` option.

Example:

```
{\fgrulerthickcm{}{}{2pt}
\rulerparams{}{}{}{5mm}{}
\fgrulernoborderline
\ruler{rightdown}{3cm}}
```

`\fgrulerthickin{`⟨*thick1*⟩`}{`⟨*thick2*⟩`}{`⟨*thick3*⟩`}{`⟨*thick4*⟩`}{`⟨*thick5*⟩`}`

Mark thicknesses in English rulers. If an argument is empty, then that parameter will not be changed.

⟨*thick1*⟩ Mark thickness at $k/16$ inch, where k is positive odd integer.

⟨*thick2*⟩ Mark thickness at $k/8$ inch, where k is positive odd integer.

⟨*thick3*⟩ Mark thickness at $k/4$ inch, where k is positive odd integer.

⟨*thick4*⟩ Mark thickness at $k/2$ inch, where k is positive odd integer.

⟨*thick5*⟩ Mark thickness at integer units.

The default values are given by ⟨*markthick*⟩ of `\rulerparams`, respectively by `markthick` option.

Example:

```
{\fgrulerthickin{}{}{}{}{2pt}
\rulerparams{}{}{}{5mm}{}
\fgrulernoborderline
\ruler[in]{rightdown}{3in}}
```

`\fgrulercolorcm{`⟨*color1*⟩`}{`⟨*color2*⟩`}{`⟨*color3*⟩`}`

Mark colors in metric rulers. If an argument is empty, then that parameter will not be changed.

⟨*color1*⟩ Mark color at $k/10$ cm, where k is positive integer and not divisible by 5.

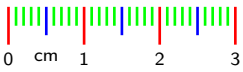
⟨*color2*⟩ Mark color at $k/2$ cm, where k is positive odd integer.

⟨*color3*⟩ Mark color at integer units.

The default values are given by ⟨*color*⟩ of `\rulerparams`, respectively by `color` option.

Example:

```
{\fgrulercolorcm{green}{blue}{red}
\rulerparams{1pt}{}{}{5mm}{}
\fgrulernoborderline
\ruler{rightdown}{3cm}}
```



`\fgrulercolorin{`⟨*color1*⟩`}{`⟨*color2*⟩`}{`⟨*color3*⟩`}{`⟨*color4*⟩`}{`⟨*color5*⟩`}`

Mark color in English rulers. If an argument is empty, then that parameter will not be changed.

⟨*color1*⟩ Mark color at $k/16$ inch, where k is positive odd integer.

⟨*color2*⟩ Mark color at $k/8$ inch, where k is positive odd integer.

⟨*color3*⟩ Mark color at $k/4$ inch, where k is positive odd integer.

⟨*color4*⟩ Mark color at $k/2$ inch, where k is positive odd integer.

⟨*color5*⟩ Mark color at integer units.

The default values are given by ⟨*color*⟩ of `\rulerparams`, respectively by `color` option.

Example:

```
{\fgrulercolorin{yellow}{orange}{green}{blue}{red}
\rulerparams{1pt}{}{}{5mm}{}
\fgrulernoborderline
\ruler[in]{rightdown}{3in}}
```

`\fgrulerreset`

It sets all options and parameters to default values. This command can only be expanded in the document body.

⚠ *All setting commands obey the normal scoping rules, i.e. if you use them inside a group, then the changing of the parameters is not valid outside the group.*

7 Examples

7.1 Deafult case

```
\documentclass{article}
\usepackage{fgruler}
\begin{document}
...
\end{document}
```

7.2 The showframe and color options

```
\documentclass{article}
\usepackage[color=red,showframe]{fgruler}
\begin{document}
...
\end{document}
```

7.3 The `type=upperright` option

```
\documentclass{article}
\usepackage[type=upperright]{fgruler}
\begin{document}
...
\end{document}
```

7.4 The `type=lowerleft` option

```
\documentclass{article}
\usepackage[type=lowerleft]{fgruler}
\begin{document}
...
\end{document}
```

7.5 The `type=lowerright` option

```
\documentclass{article}
\usepackage[type=lowerright]{fgruler}
\begin{document}
...
\end{document}
```

7.6 Shift in default case

```
\documentclass{article}
\usepackage[hshift=1cm,vshift=2cm]{fgruler}
\begin{document}
...
\end{document}
```

7.7 Shift in case type=upperright option

```
\documentclass{article}
\usepackage[type=upperright,hshift=1cm,vshift=2cm]{fgruler}
\begin{document}
...
\end{document}
```

7.8 Shift in case `type=lowerleft` option

```
\documentclass{article}
\usepackage[type=lowerleft,hshift=1cm,vshift=2cm]{fgruler}
\begin{document}
...
\end{document}
```

7.9 Shift in case `type=lowerright` option

```
\documentclass{article}
\usepackage[type=lowerright,hshift=1cm,vshift=2cm]{fgruler}
\begin{document}
...
\end{document}
```

7.10 The type=alledges option

```
\documentclass{article}
\usepackage[type=alledges]{fgruler}
\begin{document}
...
\end{document}
```

7.11 The type=alledges* option

```
\documentclass{article}
\usepackage[type=alledges*]{fgruler}
\begin{document}
...
\end{document}
```

7.12 The type=upperleftT option

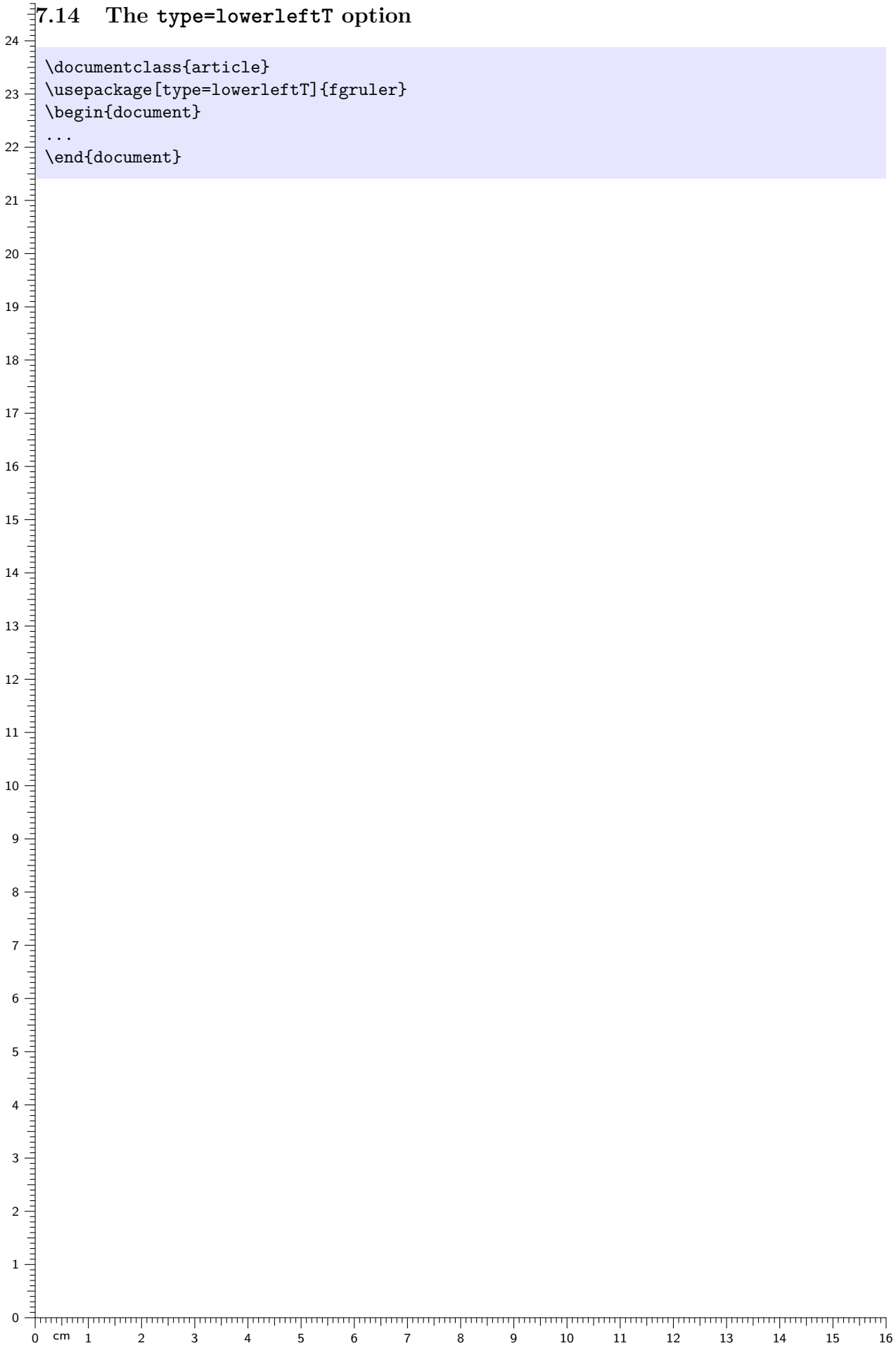
```
\documentclass{article}
\usepackage[type=upperleftT]{fgruler}
\begin{document}
...
\end{document}
```

7.13 The type=upperrightT option

```
\documentclass{article}
\usepackage[type=upperrightT]{fgruler}
\begin{document}
...
\end{document}
```

7.14 The `type=lowerleftT` option

```
\documentclass{article}
\usepackage[type=lowerleftT]{fgruler}
\begin{document}
...
\end{document}
```



7.15 The `type=lowerrightT` option

```
\documentclass{article}
\usepackage[type=lowerrightT]{fgruler}
\begin{document}
...
\end{document}
```

7.16 The type=alledgesT option

```
\documentclass{article}
\usepackage[type=alledgesT]{fgruler}
\begin{document}
...
\end{document}
```

7.17 The type=alledgesT* option

```
\documentclass{article}
\usepackage[type=alledgesT*]{fgruler}
\begin{document}
...
\end{document}
```

7.18 Combining type names

```
\documentclass{article}
\usepackage[type={alledges,alledgesT}]{fgruler}
\begin{document}
...
\end{document}
```

7.19 Setting the `type=user` option

In the next example the `type=user` option activates `type=upperright` or `type=upperleft`, depending on the page number is odd or even.

```
\documentclass{article}
\usepackage[type=user]{fgruler}
\fgrulerdefuser{
    \ifodd\value{page}\fgrulertype{\fgrulerunit}{upperright}
        \else\fgrulertype{\fgrulerunit}{upperleft}\fi
}
\begin{document}
...
\end{document}
```

7.20 Setting the type=user option

In the next example the type=user option places a vertical ruler at the left border of the text area.

```
\documentclass{article}
\usepackage[type=user]{fgruler}
\fgrulerdefuser{
    \AtTextLowerLeft{% See eso-pic package!
        \rulerparamsfromfg
        \llap{\ruler[\fgrulerunit]{downleft}{\textheight}}
    }
}
\begin{document}
...
\end{document}
```

7.21 Setting the type=user option

In the next example the type=user option places rulers at the right and bottom borders of the text area.

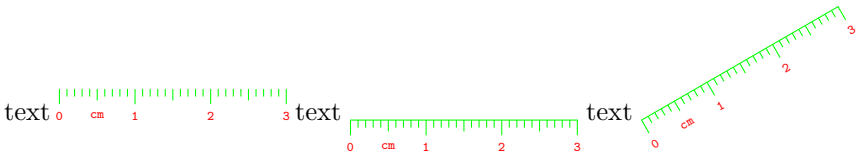
```
\documentclass{article}
\usepackage[type=user]{fgruler}
\fgrulerdefuser{
    \AtTextLowerLeft{% See eso-pic package!
        \rulerparamsfromfg
        \rulernorotatenum
        \llap{\ruler[\fgrulerunit]{downleft}{\textheight}}%
        \ruler*[\fgrulerunit]{rightdown}{\textwidth}
    }
}
\begin{document}
...
\end{document}
```

7.22 Setting the type=user option

In the next example the type=user option places rulers at the right and top borders of the text area.

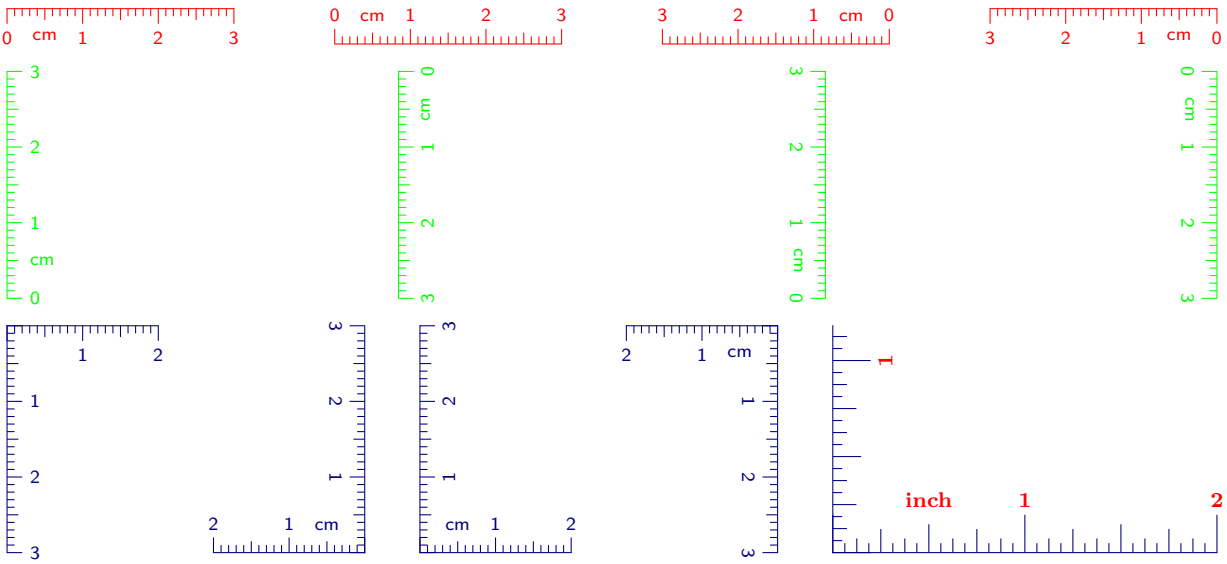
```
\documentclass{article}
\usepackage[type=user]{fgruler}
\fgrulerdefuser{
    \AtTextUpperLeft{% See eso-pic package!
        \rulerparamsfromfg
        \ruler[\fgrulerunit]{rightup}{\textwidth}%
        \rulernorotatenum
        \csname fgrulercaption\fgrulerunit\endcsname{}%
        \ruler*[\fgrulerunit]{downright}{\textheight}
    }
}
\begin{document}
...
\end{document}
```

7.23 Rulers on the foreground of the current page and in the text



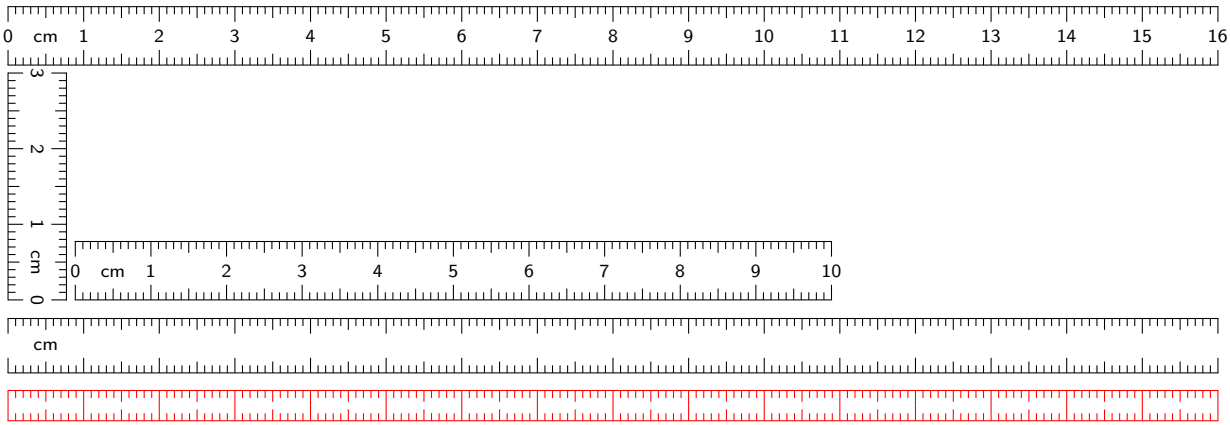

```
\documentclass{article}
\usepackage[color=blue]{fgruler}
\begin{document}
    \fgruler{upperleft}{1cm}{1.5cm}
    \fgruler*[color=red,unit=in]{lowerrightT}
    \noindent
    text
    \rulerparams{}{\color{red}\tiny\ttfamily}{green}{}{}
    {\fgrulernoborderline\ruler{rightdown}{3cm}}
    text
    \ruler*{rightdown}{3cm}
    text
    \rotatebox[origin=tl]{30}{\ruler*{rightdown}{3cm}}
    % \rotatebox is defined in graphicx package
\end{document}
```

7.24 Ruler types in the text



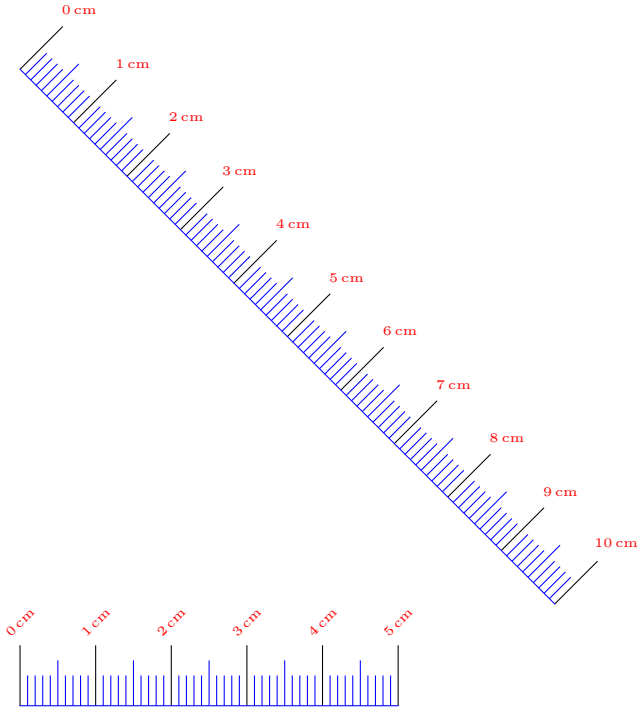

```
\documentclass{article}
\usepackage[a4paper,margin=25mm]{geometry}
\usepackage[nonefgrulers]{fgruler}
\begin{document}
    \noindent
    \rulerparams{}{}{red}{}{3pt}
    \ruler{rightdown}{3cm}
    \hfill
    \ruler{rightup}{3cm}
    \hfill
    \ruler{leftup}{3cm}
    \hfill
    \ruler{leftdown}{3cm}

    \bigskip\noindent
    \rulerparams{}{}{green}{}{}
    {\rulernorotatenum\ruler{upright}{3cm}}
    \hfill
    \ruler{downright}{3cm}
    \hfill
    \ruler{upleft}{3cm}
    \hfill
    \ruler{downleft}{3cm}

    \bigskip\noindent
    \rulerparams{}{}{blue!50!black}{}{}
    {\rulernorotatenum\fgrulercaptioncm{}\squareruler{upperleft}{2cm}{3cm}}
    \hfill
    \squareruler{lowerright}{2cm}{3cm}
    \hfill
    \squareruler{lowerleft}{2cm}{3cm}
    \hfill
    \squareruler{upperright}{2cm}{3cm}
    \hfill
    {\rulerparams{}{\footnotesize\bfseries\color{red}}{}{5mm}{}
    \squareruler[in]{lowerleft}{2in}{3cm}}
\end{document}
```

7.25 Measuring tapes



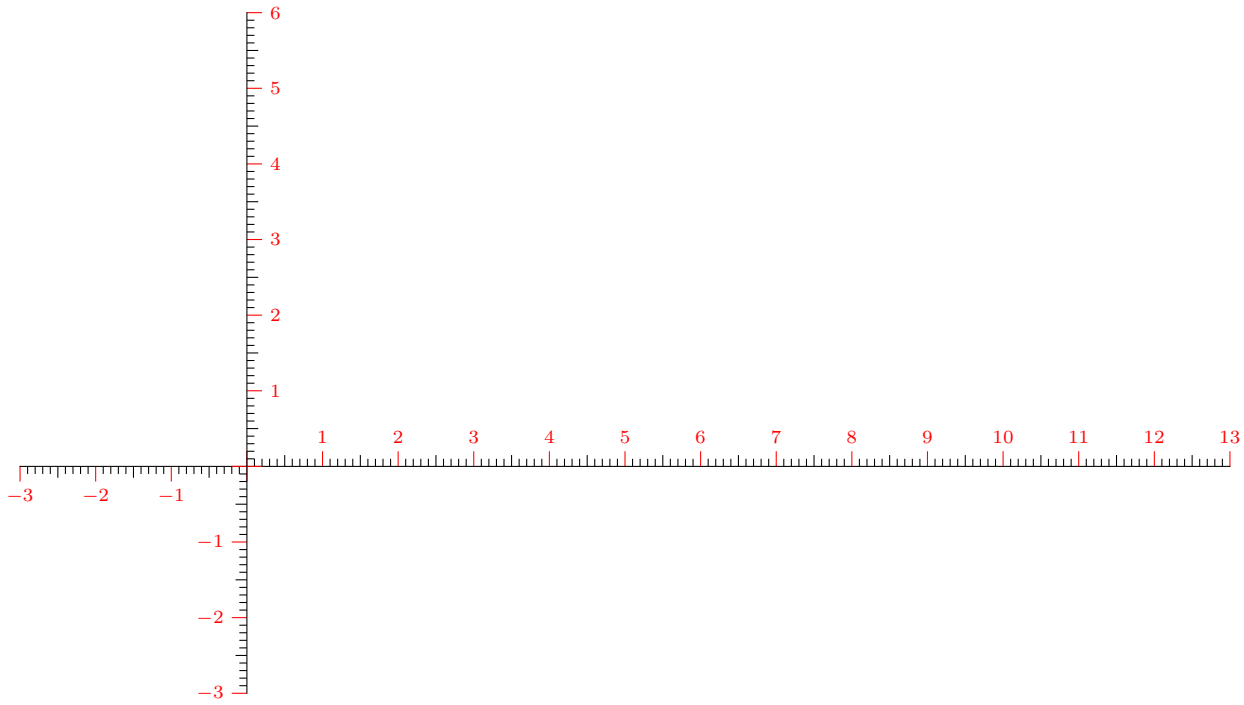

```
\documentclass{article}
\usepackage[a4paper,margin=25mm]{geometry}
\usepackage[nonefgrulers]{fgruler}
\begin{document}
    \noindent
    \ruler{taperight}{\textwidth}\\[2pt]
    \rotatebox[origin=br]{-90}{\ruler{tapeleft}{3cm}}
    \ruler{taperight}{10cm}

    \medskip\noindent
    {\fgrulerdefnum{}
    \ruler{taperight}{\textwidth}}

    \medskip\noindent
    {\fgrulerdefnum{}
    \fgrulercaptioncm{}
    \rulerparams{}{}{red}{}{0pt}
    \ruler{taperight}{\textwidth}}
\end{document}
```

7.26 Mark length and rotating



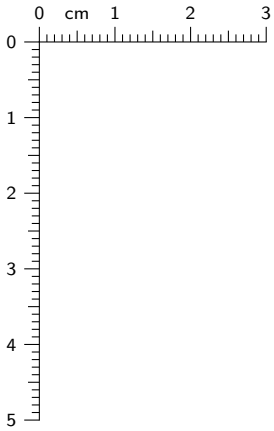

```
\documentclass{article}
\usepackage[nonefgrulers]{fgruler}
\begin{document}
    \noindent
    {\fgrulerdefnum{\rotatebox{45}{\arabic{fgrulernum}\,cm}}
    \fgrulercaptioncm{}
    \rulerparams{}{\tiny\color{red}}{blue}{8mm}{}
    \fgrulercolorcm{}{}{black}
    \rotatebox{-45}{\ruler{rightup}{10cm}}\\
    \ruler{rightup}{5cm}}
\end{document}
```

7.27 Coordinate system



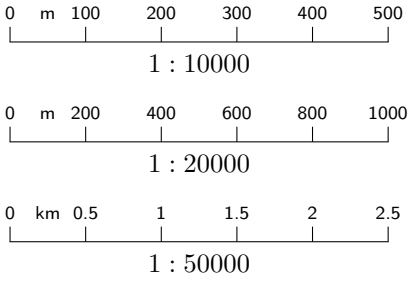

```
\documentclass{article}
\usepackage[a4paper,margin=25mm]{geometry}
\usepackage[nonefgrulers]{fgruler}
\begin{document}
    \noindent
    \rulernorotatenum
    \fgrulercaptioncm{}
    \fgrulercolorcm{}{}{red}
    \rulerparams{}{\scriptsize\color{red}}{}{}{}
    {\fgrulerdefnum{$-\arabic{fgrulernum}$}\squareruler*{upperright}{3cm}{3cm}}%
    \squareruler{lowerleft}{13cm}{6cm}
\end{document}
```

7.28 A new square ruler type




```
\documentclass{article}
\usepackage[type=none]{fgruler}
\newcommand{\usersquareruler}[2]{%
    {\rulernorotatenum\fgrulercaptioncm{}\ruler*{downleft}{#2}}%
    \ruler{rightup}{#1}%
}
\begin{document}
\usersquareruler{3cm}{5cm}
\end{document}
```

7.29 Scale bars on the maps




```
\documentclass{article}
\usepackage[nonefgrulers]{fgruler}
\usepackage{stackengine}
\def\Sstackgap{5pt}
\fgrulerratiocm{0}{0}
\fgrulercaptioncm{m}

\begin{document}

\fgrulerdefnum{\fpeval{\value{fgrulernum}*100}}
\Shortstack{\ruler{rightup}{5cm} $1:10000$}

\bigskip

\fgrulerdefnum{\fpeval{\value{fgrulernum}*200}}
\Shortstack{\ruler{rightup}{5cm} $1:20000$}

\bigskip

\fgrulercaptioncm{km}
\fgrulerdefnum{\fpeval{\value{fgrulernum}*.5}}
\Shortstack{\ruler{rightup}{5cm} $1:50000$}

\end{document}
```