

# The graphpap package\*

Leslie Lamport

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`\graphpaper[ $\langle N \rangle$ ]( $\langle X, Y \rangle$ )( $\langle DX, DY \rangle$ )` Makes a grid with left-hand corner at ( $\langle X, Y \rangle$ ), extending ( $\langle DX, DY \rangle$ ) units in the X and Y directions, where the lines are  $N$  units apart. Every fifth line is thick and is numbered. The default value of  $N$  is 10. The arguments must all be integers.

First, we define three counters. The first two are defined as raw TeX counters since multiplication and division must be performed in them.

```
1 \*package
2 % \newcount\@gridx% now  (\@tempcnta)
3 % \newcount\@gridy% now  (\@tempcntb)
4 % \newcounter{grid}
5 \let\c@grid\count@
```

Next we define the following commands to draw vertical and horizontal grids. The “nonum” commands just draw the grids; the other commands also print numbers. All the arguments must be integers.

## VERTICAL GRIDS

```
\vgrid( $\langle xpos, ypos \rangle$ ){ $\langle xincrement \rangle$ }{ $\langle number-of-lines \rangle$ }{ $\langle length-of-lines \rangle$ }
\nonumvgrid( $\langle xpos, ypos \rangle$ ){ $\langle xincrement \rangle$ }{ $\langle number-of-lines \rangle$ }{ $\langle length-of-lines \rangle$ }
```

## HORIZONTAL GRIDS

```
\hgrid( $\langle xpos, ypos \rangle$ ){ $\langle yincrement \rangle$ }{ $\langle number-of-lines \rangle$ }{ $\langle length-of-lines \rangle$ }
\nonumhgrid same as \hgrid but no numbers drawn
```

```
6 \def\vgrid(#1,#2)#3#4#5{%
7   \setcounter{grid}{#1}%
8   \multiput(#1,#2)(#3,0){#4}{\line(0,1){#5}}%
9   \multiput(#1,#2)(#3,0){#4}{\vgridnumber{#3}}}
10 \def\vgridnumber#1{%
11   \makebox(0,0)[t]{%
12     \shortstack{\rule{0pt}{10pt}}\arabic{grid}}}%
13   \addtocounter{grid}{#1}}
14 \def\nonumvgrid(#1,#2)#3#4#5{%
15   \multiput(#1,#2)(#3,0){#4}{\line(0,1){#5}}}
16 \def\hgrid(#1,#2)#3#4#5{%
17   \setcounter{grid}{#2}%
18   \multiput(#1,#2)(0,#3){#4}{\line(1,0){#5}}%
19   \multiput(#1,#2)(0,#3){#4}{\hgridnumber{#3}}}
20 \def\hgridnumber#1{%
21   \makebox(0,0)[r]{\arabic{grid}\hspace{10pt}}}%
22   \addtocounter{grid}{#1}}
23 \def\nonumhgrid(#1,#2)#3#4#5{%
24   \multiput(#1,#2)(0,#3){#4}{\line(1,0){#5}}}
```

Finally, `\graphpaper` is defined in a straightforward way in terms of the commands above.

`\graphpaper`

```
25 \newcommand\graphpaper[1][10]{\leavevmode\@grid{#1}}
```

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```

\@grid
26 \def\@grid#1(#2,#3)#4{\@grid@i{#1}{#2}{#3}{}}

\@grid@i
27 \def\@grid@i#1#2#3(#4,#5){%
28   \@tempcnta=#4\relax
29   \divide\@tempcnta#1\relax
30   \advance\@tempcnta1\relax
31   {\thinline\@nonumvgrid(#2,#3){#1}{\@tempcnta}{#5}
32     \@tempcnta#4\relax
33     \divide\@tempcnta5\relax
34     \divide\@tempcnta#1\relax
35     \advance\@tempcnta1\relax
36     \@tempcntb5\relax
37     \multiply\@tempcntb#1\relax
38     \thicklines\@vgrid(#2,#3){\@tempcntb}{\@tempcnta}{#5}
39     \@tempcnta#5\relax
40     \divide\@tempcnta #1\relax
41     \advance\@tempcnta1\relax
42     \thinline\@nonumhgrid(#2,#3){#1}{\@tempcnta}{#4}
43     \@tempcnta#5\relax
44     \divide\@tempcnta5\relax
45     \divide\@tempcnta#1\relax
46     \advance\@tempcnta1\relax
47     \thicklines\@hgrid(#2,#3){\@tempcntb}{\@tempcnta}{#4}}%
48   \ignorespaces}
49 \endpackage

```