The graphpap package*

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`\graphpaper[`⟨*N*⟩`](`⟨*X,Y*⟩`)(`⟨*DX,DY*⟩`)` Makes a grid with left-hand corner at `(`⟨*X,Y*⟩`)`, extending `(`⟨*DX,DY*⟩`)` 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.

```
⟨*package⟩
% \newcount\@gridx% now  (\@tempcnta)
% \newcount\@gridy% now  (\@tempcntb)
% \newcounter{@grid}
\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(`⟨*xpos,ypos*⟩`){`⟨*xincrement*⟩`}`
`{`⟨*number-of-lines*⟩`}{`⟨*length-of-lines*⟩`}`
`\@nonumvgrid(`⟨*xpos,ypos*⟩`){`⟨*xincrement*⟩`}`
`{`⟨*number-of-lines*⟩`} {`⟨*length-of-lines*⟩`}`

HORIZONTAL GRIDS

`\@hgrid(`⟨*xpos,ypos*⟩`){`⟨*yincrement*⟩`}`
`{`⟨*number-of-lines*⟩`}{`⟨*length-of-lines*⟩`}`
`\@nonumhgrid` same as `\@hgrid` but no numbers drawn

```
\def\@vgrid(#1,#2)#3#4#5{%
  \setcounter{@grid}{#1}%
  \multiput(#1,#2)(#3,0){#4}{\line(0,1){#5}}%
  \multiput(#1,#2)(#3,0){#4}{\@vgridnumber{#3}}}
\def\@vgridnumber#1{%
  \makebox(0,0)[t]{%
    \shortstack{\rule{0pt}{10pt}\\\arabic{@grid}}}%
  \addtocounter{@grid}{#1}}
```

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```
\def\@nonumvgrid(#1,#2)#3#4#5{%
  \multiput(#1,#2)(#3,0){#4}{\line(0,1){#5}}}
\def\@hgrid(#1,#2)#3#4#5{%
  \setcounter{@grid}{#2}%
  \multiput(#1,#2)(0,#3){#4}{\line(1,0){#5}}%
  \multiput(#1,#2)(0,#3){#4}{\@hgridnumber{#3}}}
\def\@hgridnumber#1{%
  \makebox(0,0)[r]{\arabic{@grid}\hspace{10pt}}%
  \addtocounter{@grid}{#1}}
\def\@nonumhgrid(#1,#2)#3#4#5{%
  \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

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

\@grid

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

\@grid@i

```
\def\@grid@i#1#2#3(#4,#5){%
  \@tempcnta=#4\relax
  \divide\@tempcnta#1\relax
  \advance\@tempcnta1\relax
   {\thinlines\@nonumvgrid(#2,#3){#1}{\@tempcnta}{#5}
    \@tempcnta#4\relax
    \divide\@tempcnta5\relax
    \divide\@tempcnta#1\relax
    \advance\@tempcnta1\relax
    \@tempcntb5\relax
    \multiply\@tempcntb#1\relax
    \thicklines\@vgrid(#2,#3){\@tempcntb}{\@tempcnta}{#5}
    \@tempcnta#5\relax
    \divide\@tempcnta #1\relax
    \advance\@tempcnta1\relax
    \thinlines\@nonumhgrid(#2,#3){#1}{\@tempcnta}{#4}
    \@tempcnta#5\relax
    \divide\@tempcnta5\relax
    \divide\@tempcnta#1\relax
    \advance\@tempcnta1\relax
    \thicklines\@hgrid(#2,#3){\@tempcntb}{\@tempcnta}{#4}}%
  \ignorespaces}
⟨/package⟩
```