LaTeX Experiments
Part II: Pictures

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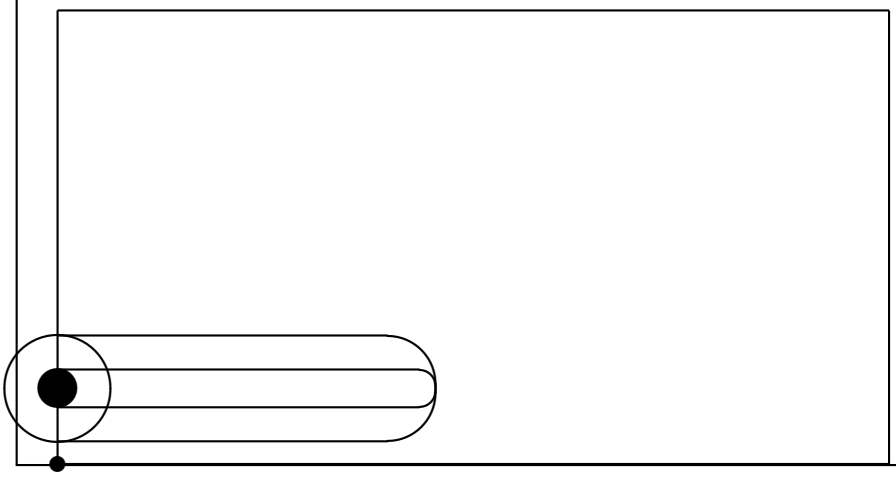
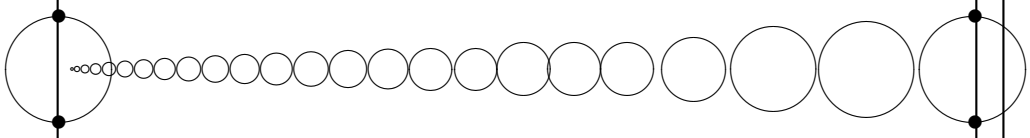
1 Picture environment

- `https://en.wikibooks.org/wiki/LaTeX/Picture`
- `https://www.overleaf.com/learn/latex/Picture_environment`
- The default value of `\unitlength` is 1pt.

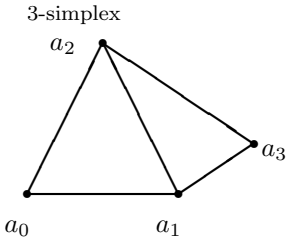
Picture is the standard tool to create figures in LaTeX. This tool is sometimes too restrictive and cumbersome to work with, but it's supported by most of the compilers and no extra packages are needed. If you need to create complex figures, for more suitable and powerful tools see the TikZ and Pgfplots packages.



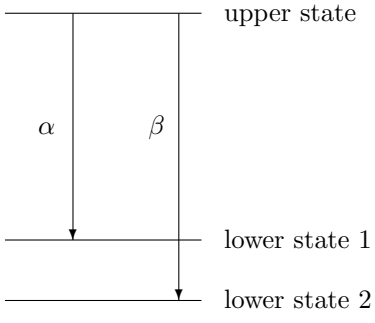
1.1 layout and several examples



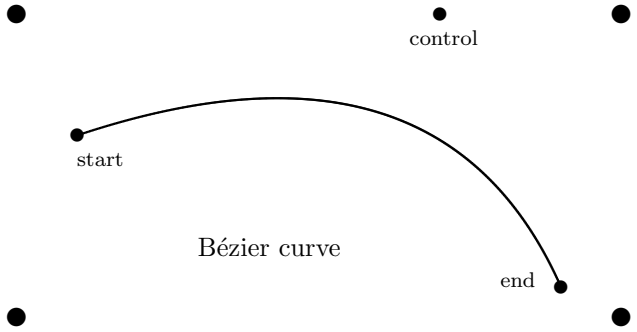
Above is the the picture in first paragraph (no indent), below is picture in next paragraph (with indent).



Some text to demonstrate different effect of `\noindent` on text (here) and on picture (above without `\noindent` and below with `\noindent`). Compare the four corner dots for pictures above and below.



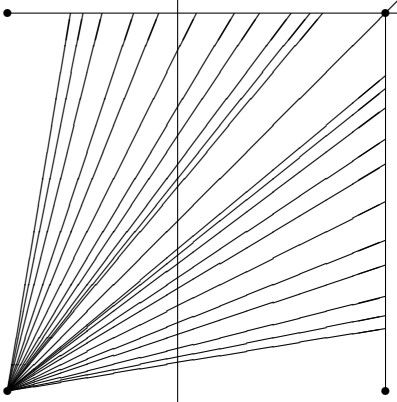
Regular paragraph (without `\noindent`).



1.2 line

`\put(x,y){\line(x1,y1){length}}`

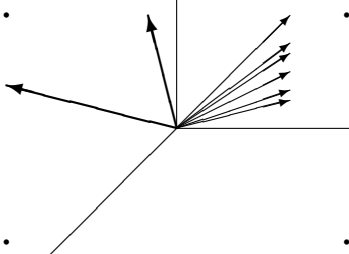
The components of the direction vector `(x1,y1)` of the line segment `\line(x1,y1){length}` are restricted to the integers $(-6, -5, ..., 5, 6)$ and they have to be coprime. The figure below illustrates all 25 possible slope values in the first quadrant.



1.3 vector

`\put(x,y){\vector(x1,y1){length}}`

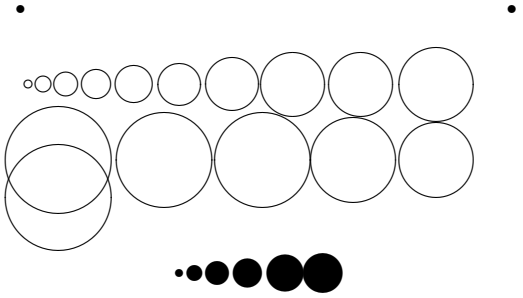
For vectors, the components of the direction vector are even more narrowly restricted than for line segments, namely to the integers $(-4, -3, ..., 3, 4)$. Components also have to be coprime. Notice the effect of the `\thicklines` command on the two arrows pointing to the upper left.



1.4 circle

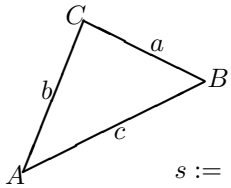
`\put(x,y){\circle{diameter}}`

The picture environment only admits diameters up to approximately 14mm (40pt) for circles and 5mm (14pt) for disks, and even below this limit, not all diameters are possible.



1.5 Text and formulae

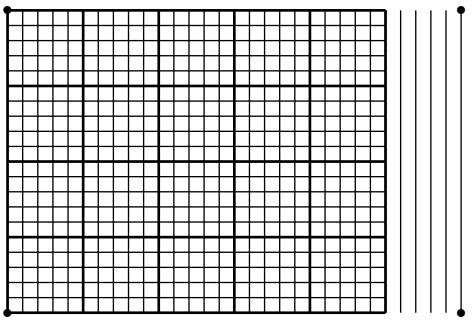
$$F = \sqrt{s(s-a)(s-b)(s-c)}$$



$$s := \frac{a+b+c}{2}$$

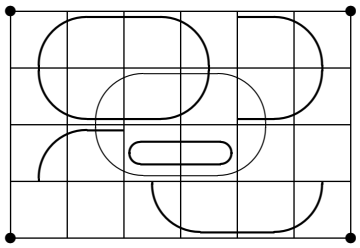
1.6 multiput

`\multiput(x,y)(dx,dy){n}{object}`



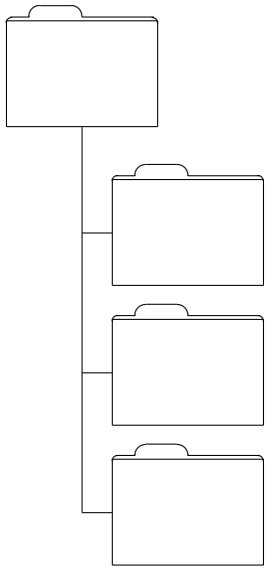
1.7 oval

```
\put(x,y){\oval(w,h)[position:b,t,l,r]}
```



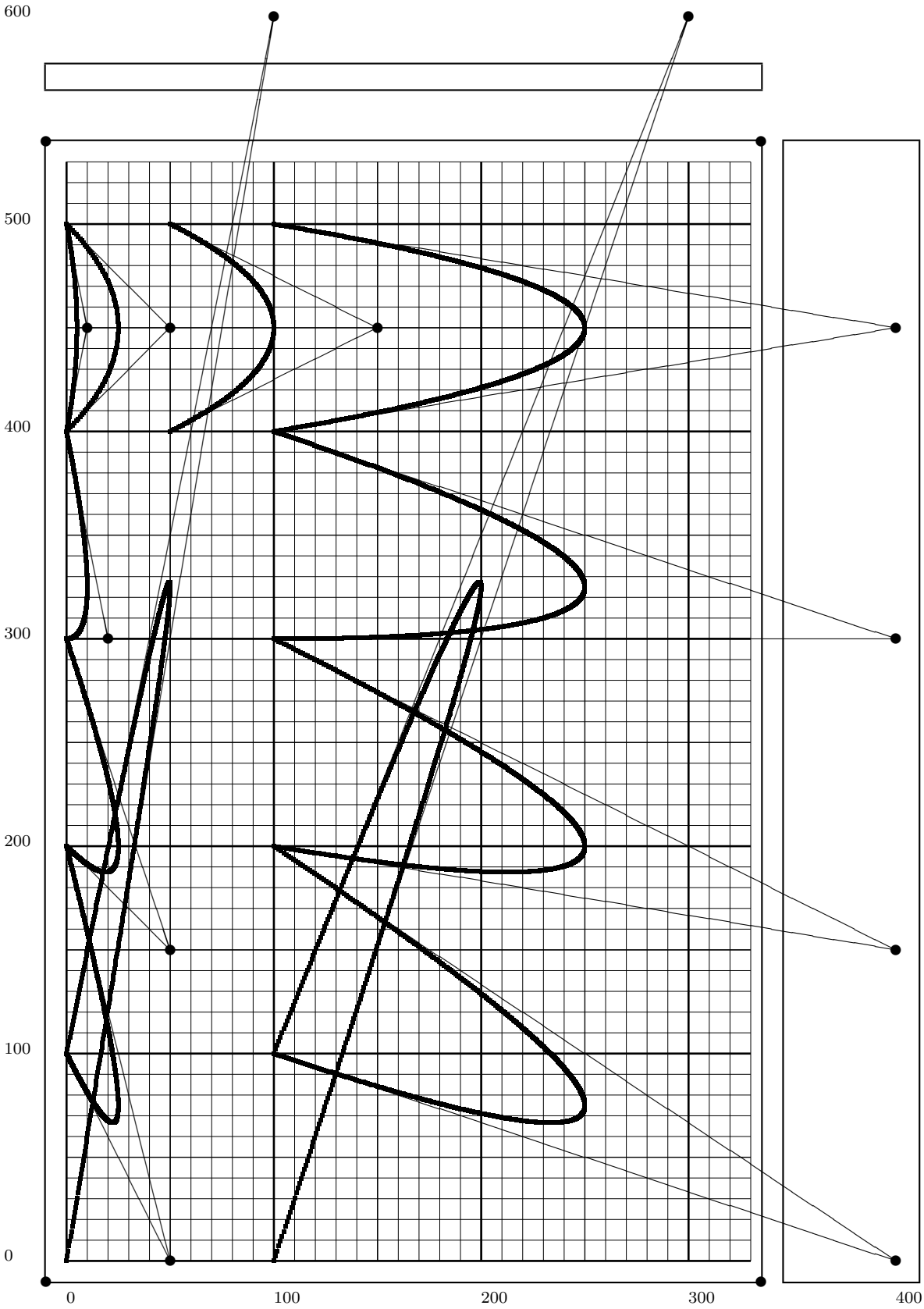
1.8 Predefined picture boxes

```
\newsavebox{name}
\savebox{name}(width,height)[position]{content}
\put(x,y){\usebox{name}}
```



1.9 Quadratic Bézier curves

```
\qbezier(x1,y1)(x,y)(x2,y2)
```


600
500
400
300
200
100
0
0
100
200
300
400