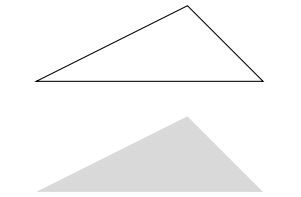
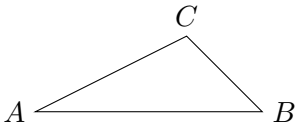
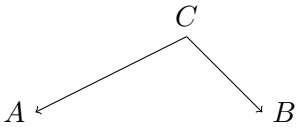
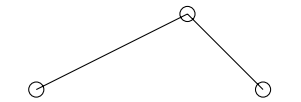
1 Simple drawings

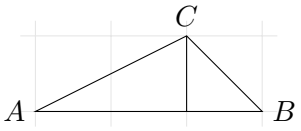


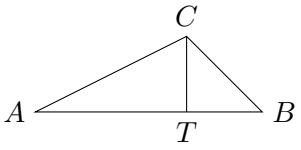


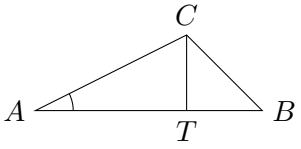


Don't forget that circles can also be segments in a path!

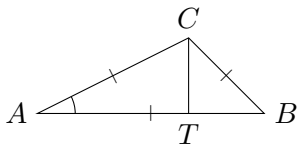




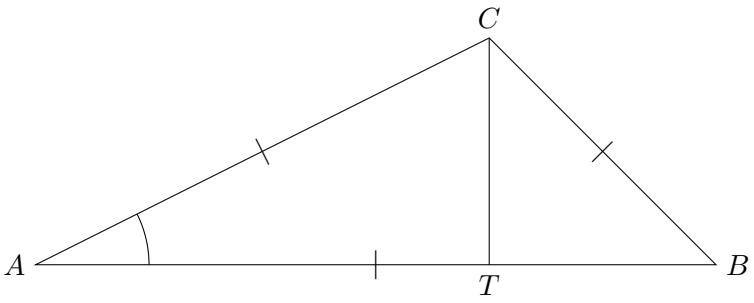




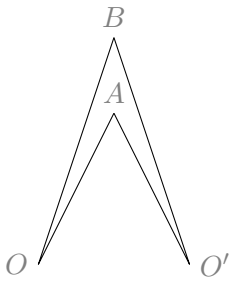
For the next one, you may want to use the miniature variant ˛ (written `$\scriptscriptstyle|$`) of the symbol |:



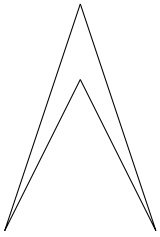
Or scale up the triangle and use | in its original size[1] :



Draw the following variant



of this drawing from the lecture:

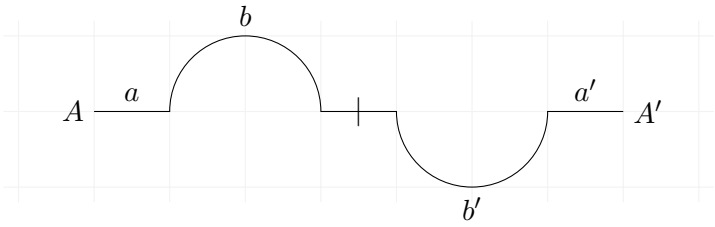


```
\begin{tikzpicture}
  \coordinate (O) at (0,0) ;
  \coordinate (O') at (2,0);
  \coordinate (A) at (1,2) ;
  \coordinate (B) at (1,3) ;
  \draw (O) -- (A) (B) -- (O);
  \draw (O') -- (A) (B) -- (O') ;
\end{tikzpicture}
```

Use the optional argument `gray` of `node` to make the letters stand out less.

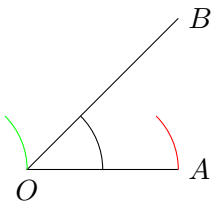
[1] see near the end of the Ti*k*Z notes how to do that!

2 Arcs



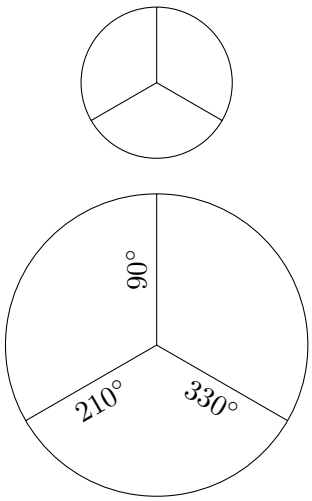
3 Polar coordinates

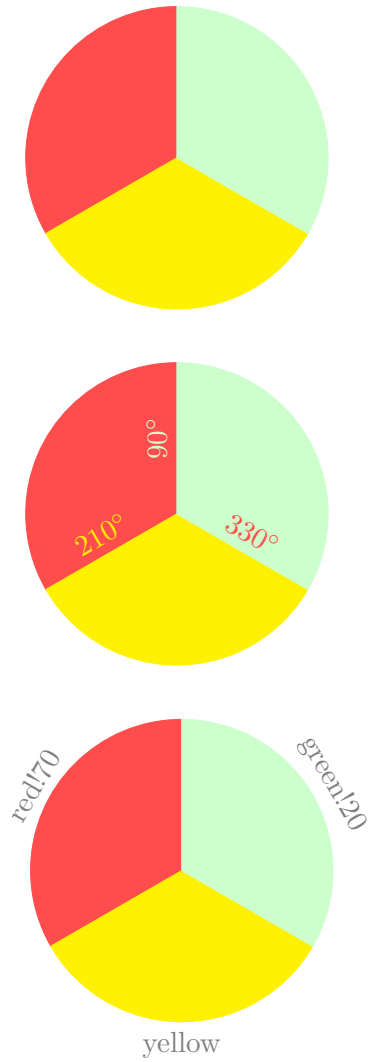
In the lecture we had the following picture:




```
\begin{tikzpicture}
 \draw (2,0) node[right] {$A$}
   -- (0,0) node[below] {$O$}
   -- (2,2) node[right] {$B$};
 \draw[green] (0,0) arc (0:45:1) ;
 \draw (1,0) arc (0:45:1) ;
 \draw[red] (2,0) arc (0:45:1) ;
\end{tikzpicture}
```

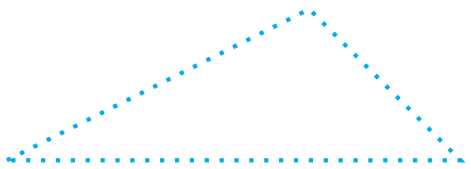
Redo this, using polar coordinates!





4 Aesthetics

Draw a triangle with lines of different thicknesses, styles and colours! For example

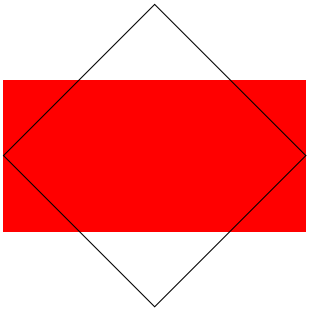


5 Relative coordinates

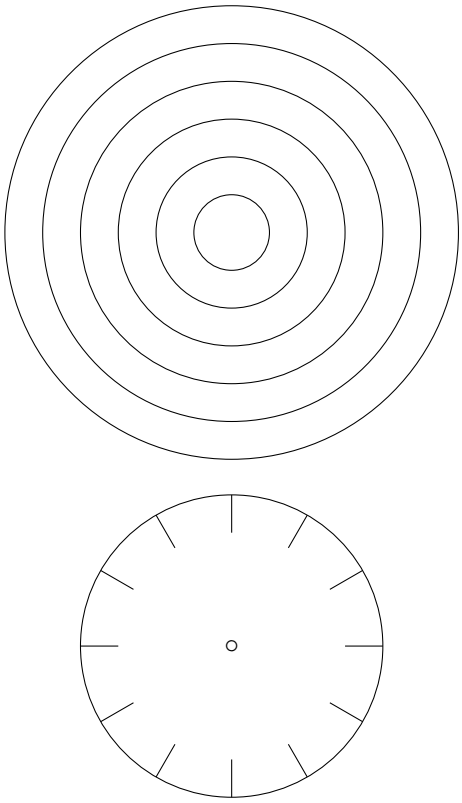
Redo the first drawing of §3 with relative polar coordinates (and see how much easier it is)!

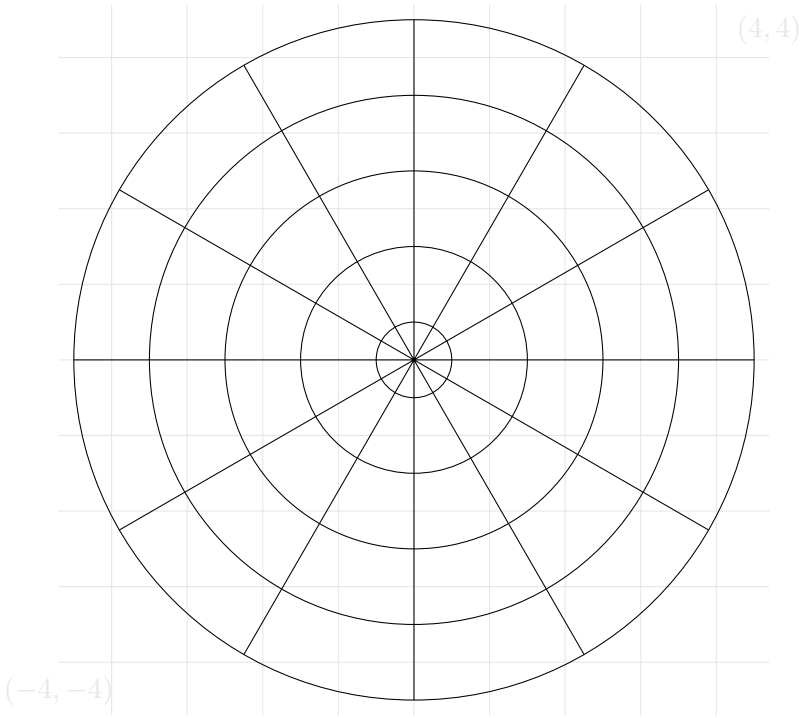
6 Cropping

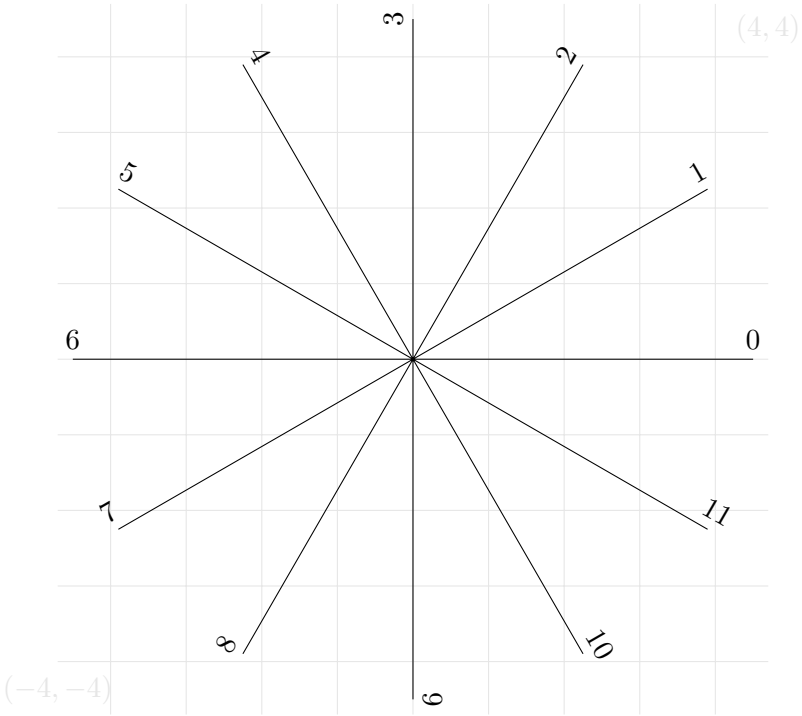
Hint:

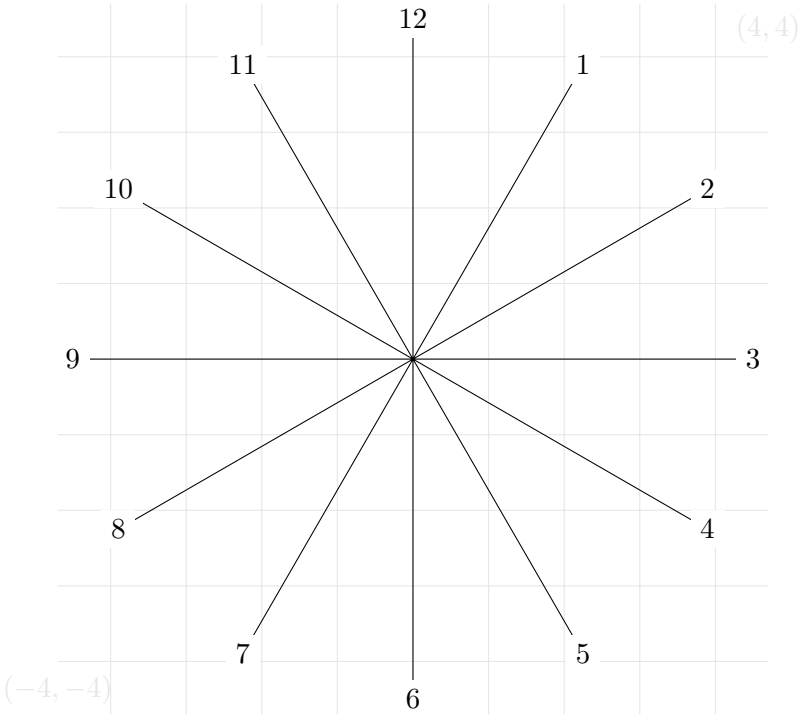


7 Loops

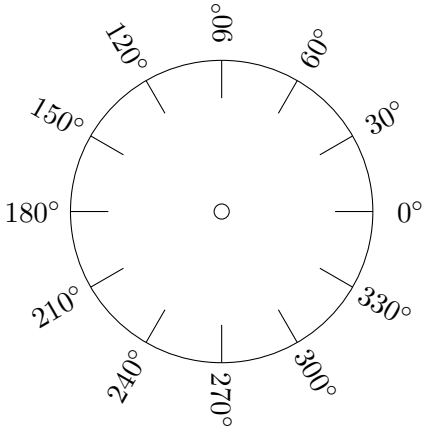



(4, 4)
(−4, −4)


(4, 4)
3
4
2
5
1
6
0
7
11
8
10
9
(−4, −4)

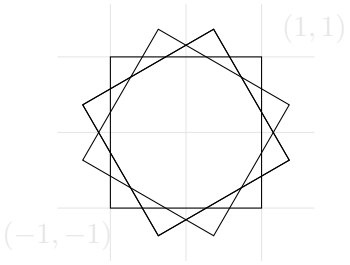


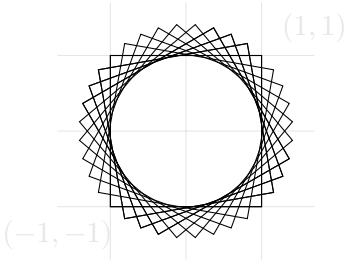
Hint for the next one: recall that one can draw with white ink, and that the colour of a node can be specified independently of the color of the path (the syntax is: `node[...,color=black]`).

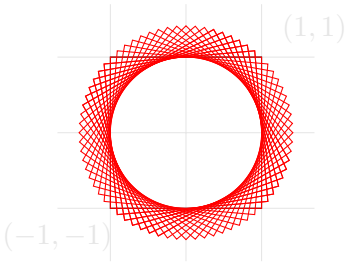


red green blue cyan yellow magenta black white gray

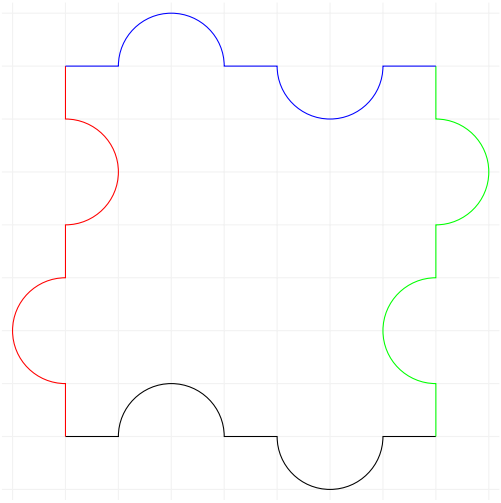
8 Transformations



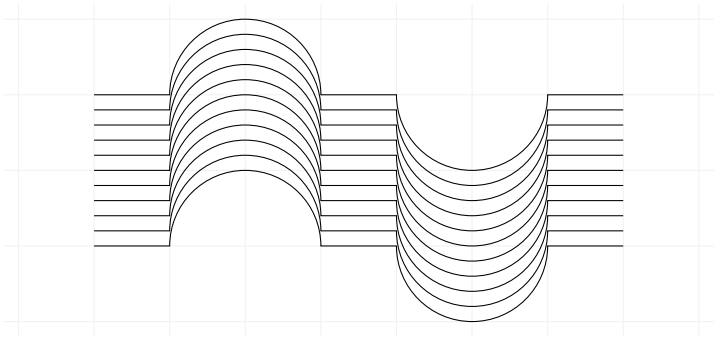




For the next one, use the first example in Section 2 and `rotate around` (and perhaps `shift`).

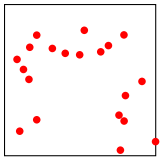


Use `yshift` and `\foreach`! (For `yshift` the unit doesn't seem to be centimeters, so you may have to write something like `yshift = 0.2cm`.)

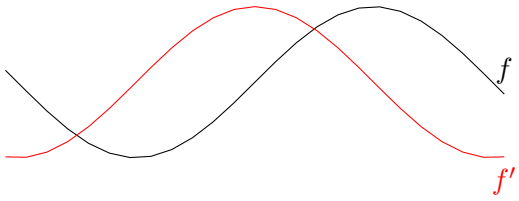


9 Plots

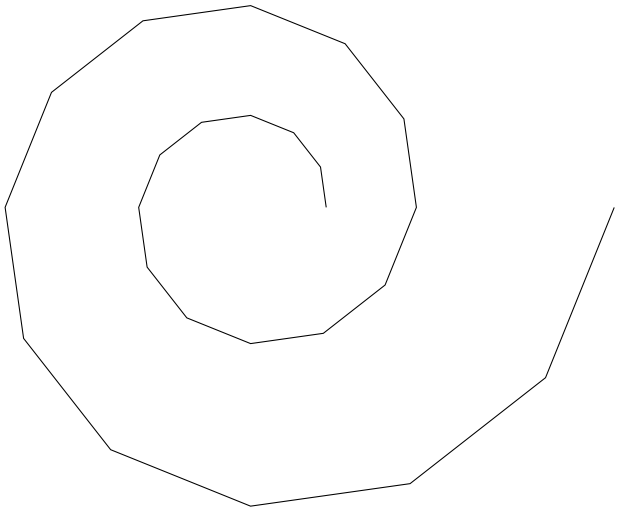
20 random dots in a 2×2-es square:



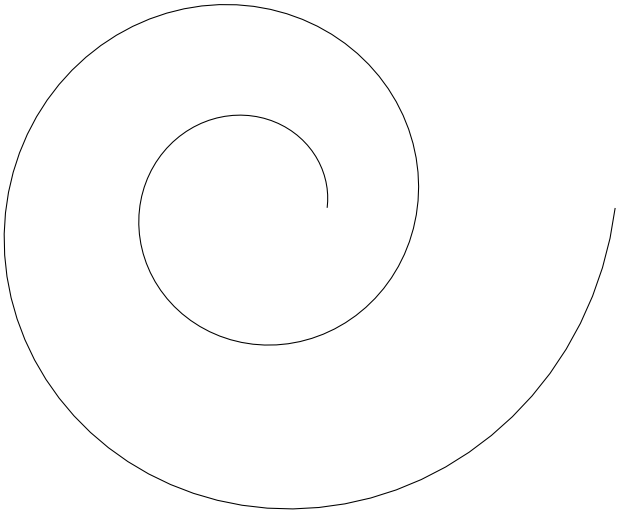
Segments cannot be labeled, so for example `near start` doesn't work here, but points can, so `above`, `below` etc. do. (Surprisingly, `midway` also seems to work.)



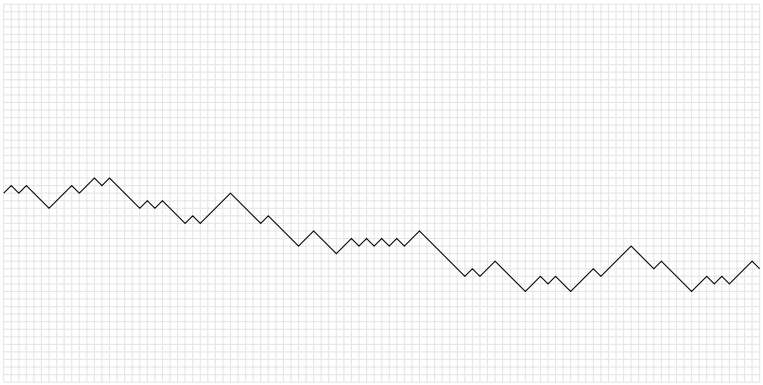
The next one is the plot of the set $\{\,(\varphi, e^{\varphi/8}) \mid \varphi \in [0, 4\pi]\,\}$ where the points are given in polar coordinates. Don't forget that TikZ expects the angle in degrees, and that you can convert to degrees using `deg`.



We can make this look smoother by including `samples=150` as one of `plot`'s options:



Random walk: start at 0, and at each step move (right and) one unit up or down with equal probability. Use `scale` as an option to `tikzpicture`!



This one used a hundred iteration. The next one uses 500, and does it four times, with different colours: