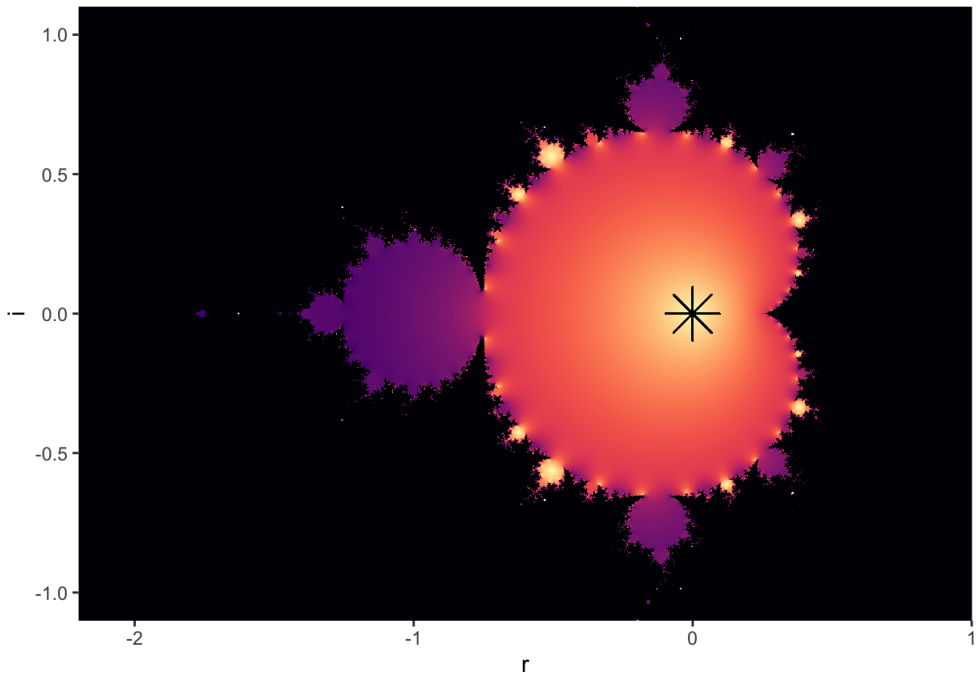
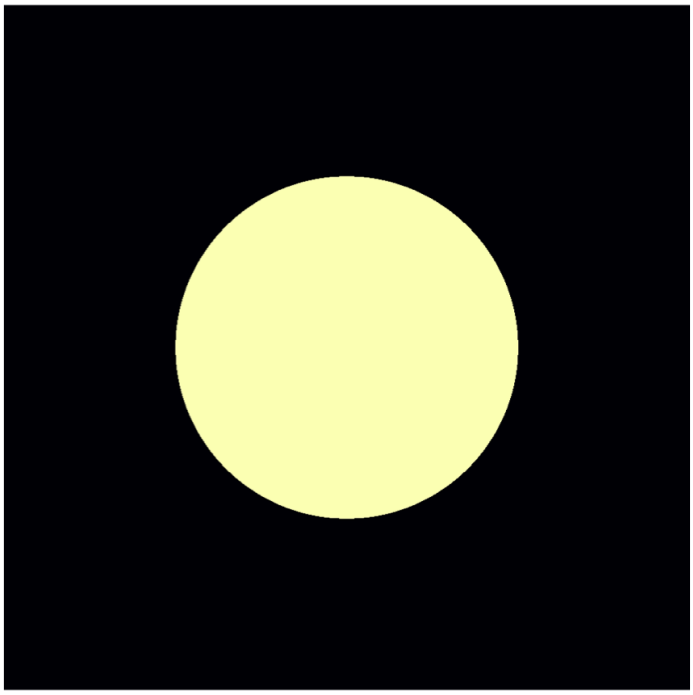
Chapter 25

(25.4) Use the Mandelbrot set as an encyclopedia to find Julia sets with the following properties. For each, print out or sketch a picture of the Julia set, note the c value for the Julia set, and indicate where in the Mandelbrot set you found the c value:

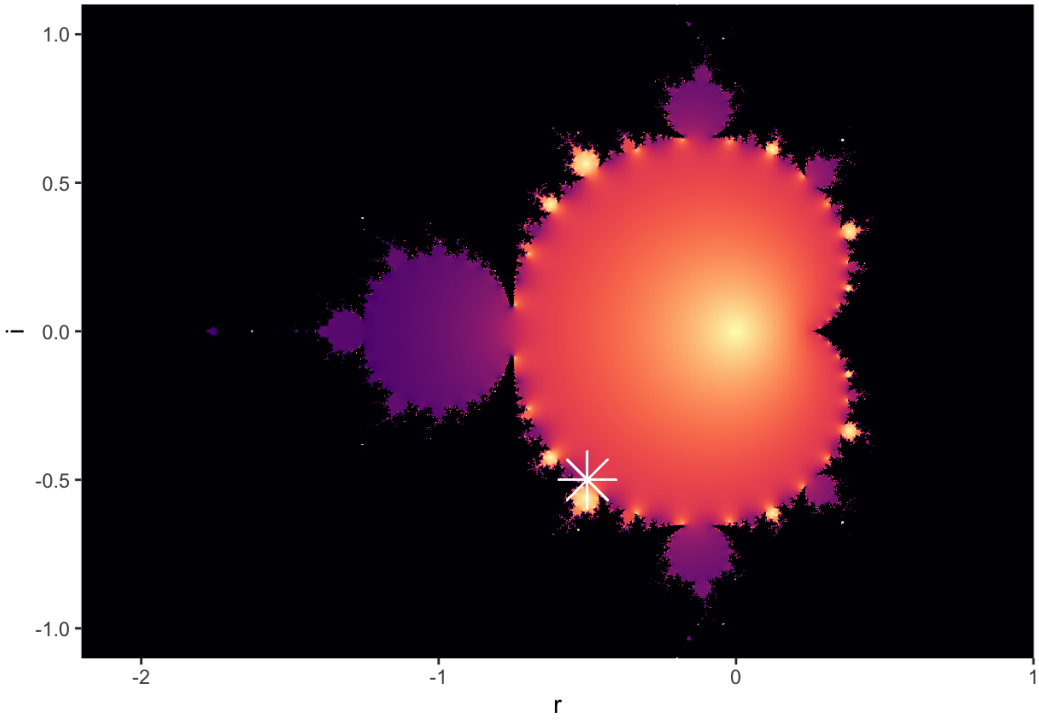
(a) The Julia set is a single connected blob.

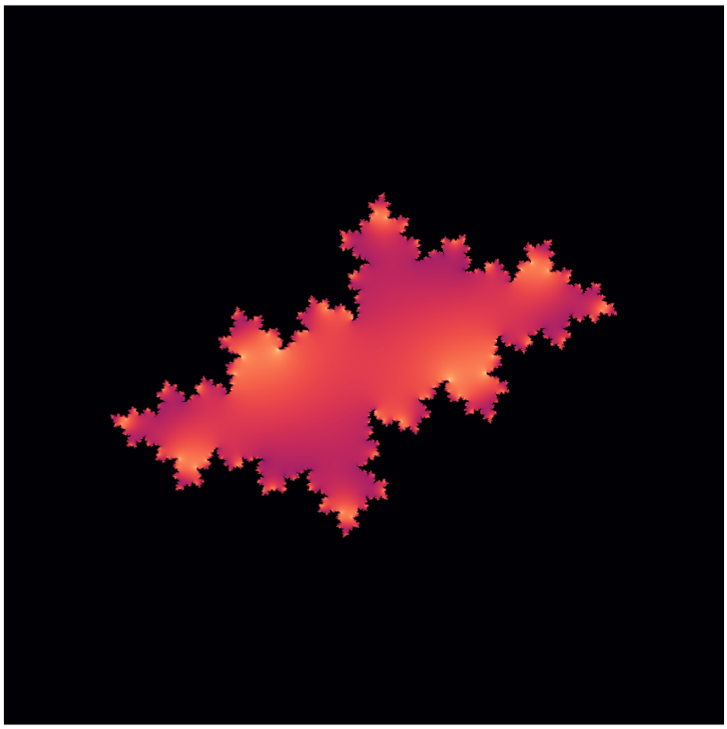
The Julia set for C = 0+0i is one such set: (examples plotted in R)





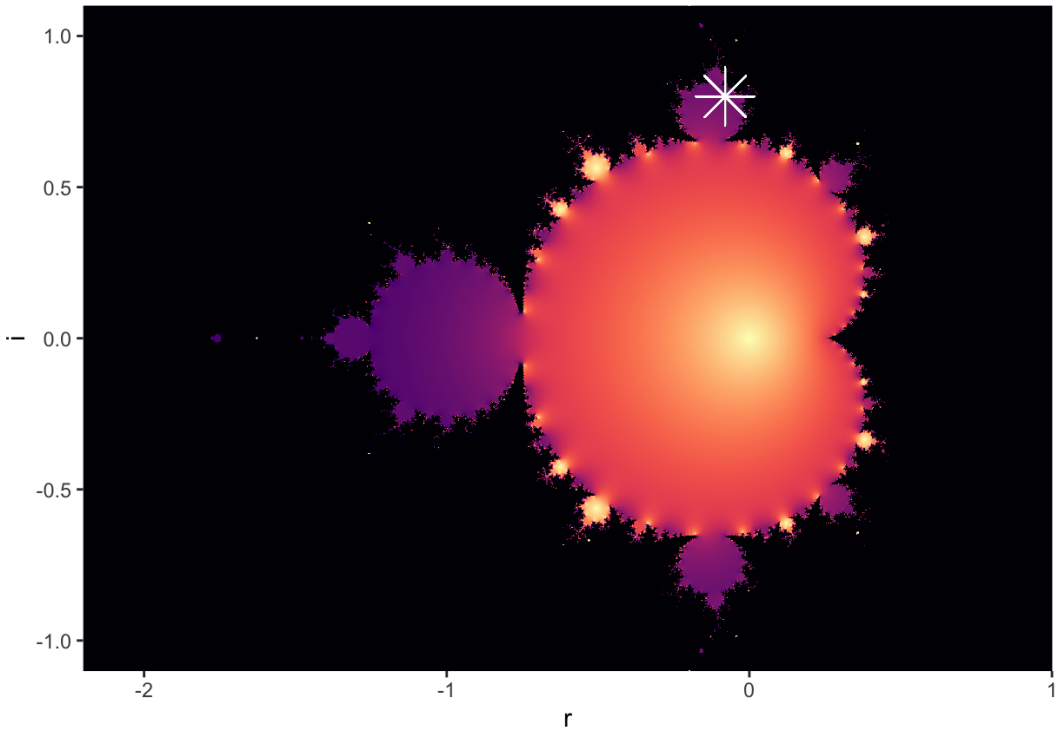
It's really cool that it makes a perfect circle, and part of me is satisfied by the mystery of why the Julia set for C = 0+0i has this property, but I also yearn for rougher shapes, so here's another Julia set that is a single connected blob: the set for C = -0.5-0.5i:

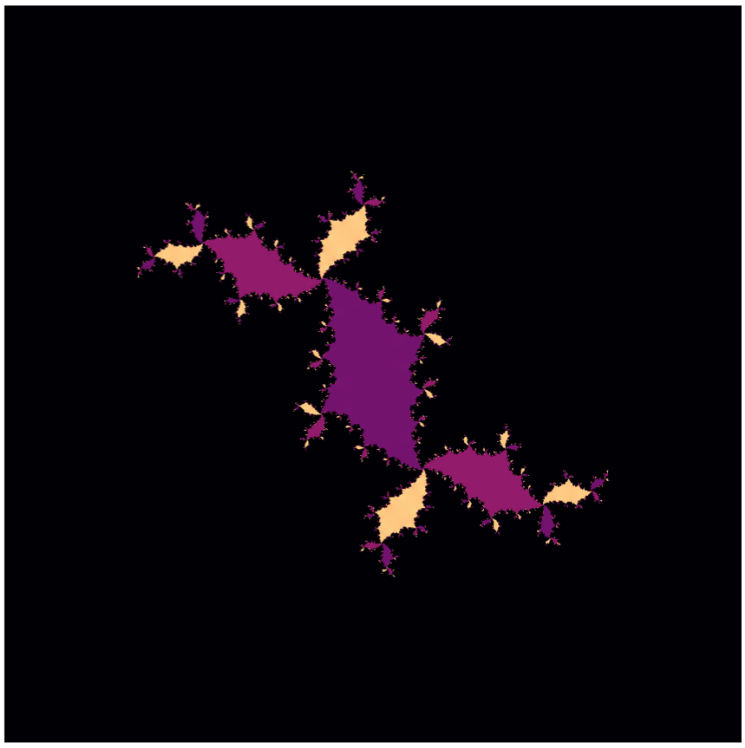




(b) The Julia set has three arms, i.e., three structures which join at a junction point.

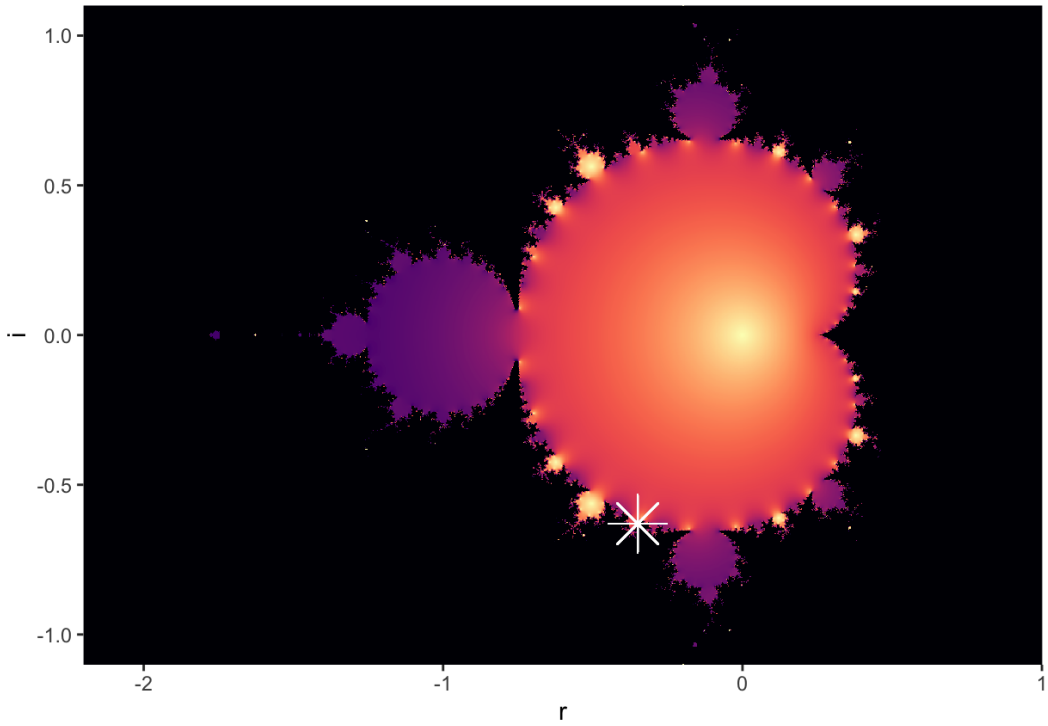
The Julia set for C = -0.8+0.8i is one such set:

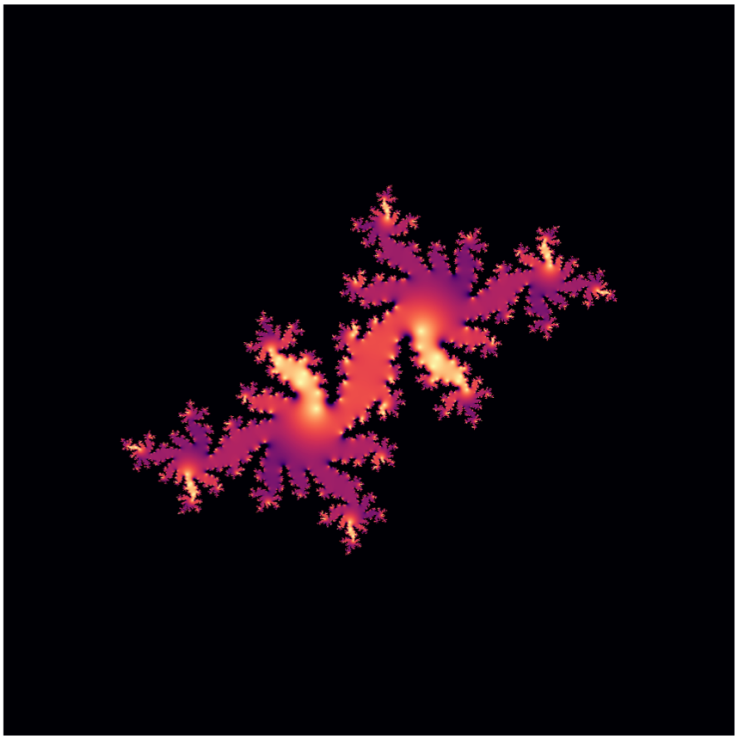




(c) The Julia set has eight arms.

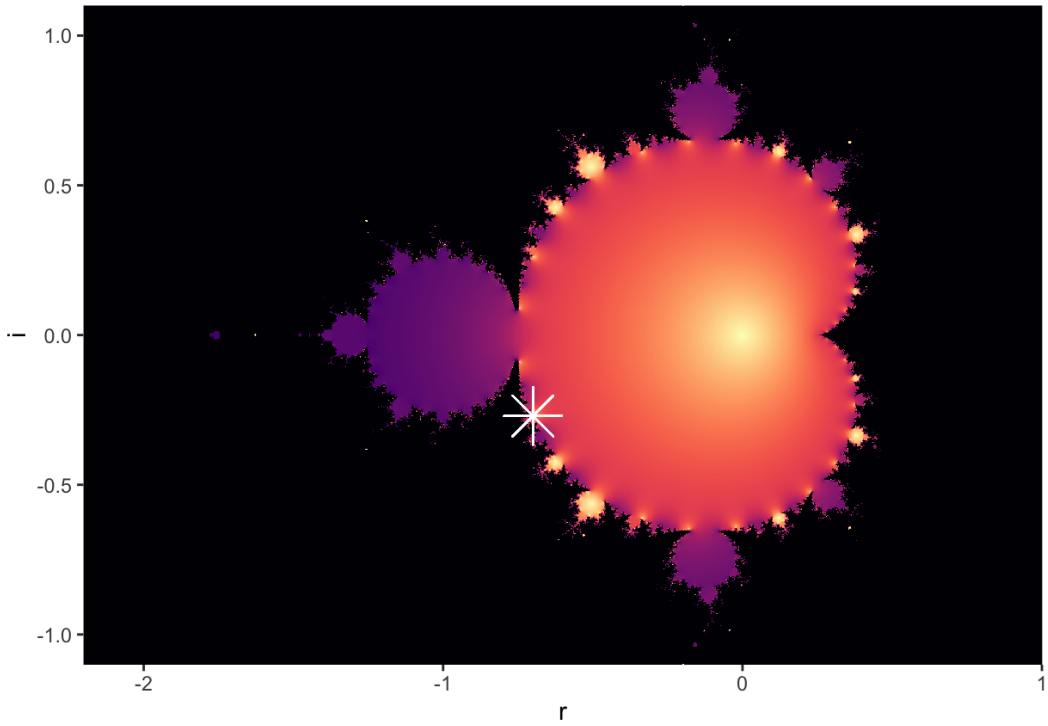
The Julia set for C = -0.35-0.63i is one such set:

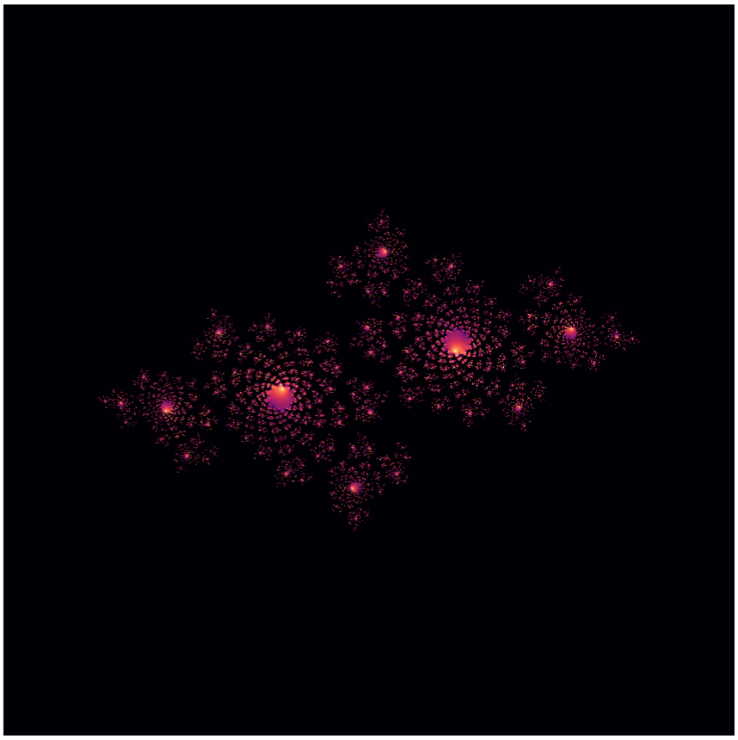




(d) The Julia set has eleven arms.

The Julia set for C = -0.3-0.7i is one such set:



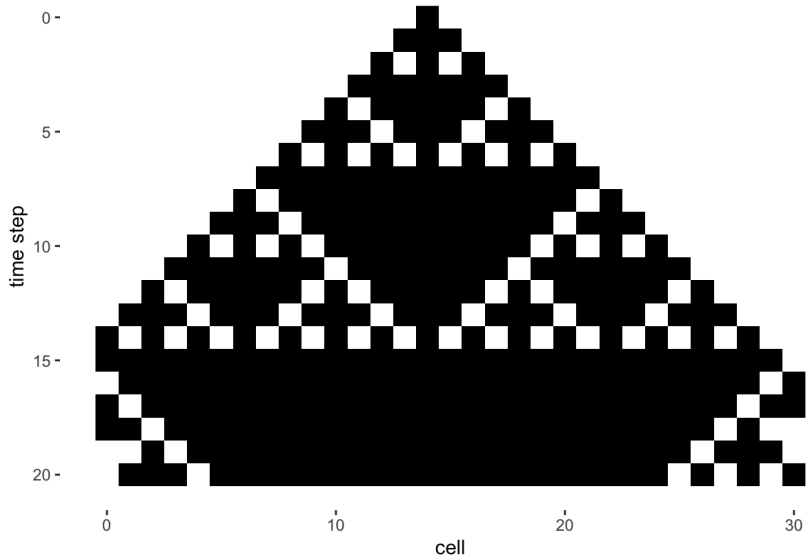


Chapter 27

(27.3) Consider rule 182, shown in Fig. 27.18. Starting with a single black cell, iterate using rule 192 for twenty or so time-steps.

Fig. 27.18 CA rule 182.

Here it is iterated for twenty time steps:



For fun, here it is also iterated 200 time steps: