Julia set:

Choose a number c to specify which set to draw.

Choose a point z_0, and check if it is in the set:

Do a lot of iterations of $z_n = {z_{n-1}}^2 + c$ (think infinitely many)

If any of the iterations get too big ($r > 2$), z_0 is not in the set

If all of the iterations stay small, z_0 is in the set.

If z_0 is in the set, then all of its iterations are too.

Notice: every Julia set is symmetric around the origin (0+0i)

If the point 0+0i is in the set, the whole set is connected

If the point 0+0i is not in the set, the Julia set is not connected

Mandelbrot set:

Choose a number $c = z_0$ to specify a point in the plane.

Look at the Julia set for c. If the Julia set is connected, then $c = z_0$ is in the Mandelbrot set

There's a shortcut, so you don't have to draw the whole Julia set every time:

Check if the point 0+0i is in the Julia set for c

That means that if you iterate $z_0 = 0 + 0i$ with the function $z_n = {z_{n-1}}^2 + c$

(and, notice that $z_1 = 0^2 + c = c$, so this is the same as iterating c in $z_n = {z_{n-1}}^2 + c$)

then if $z_1 = c$ or $z_0 = 0 + 0i$ is in the Julia set (its iterations are bounded), then c is in the Mandelbrot set