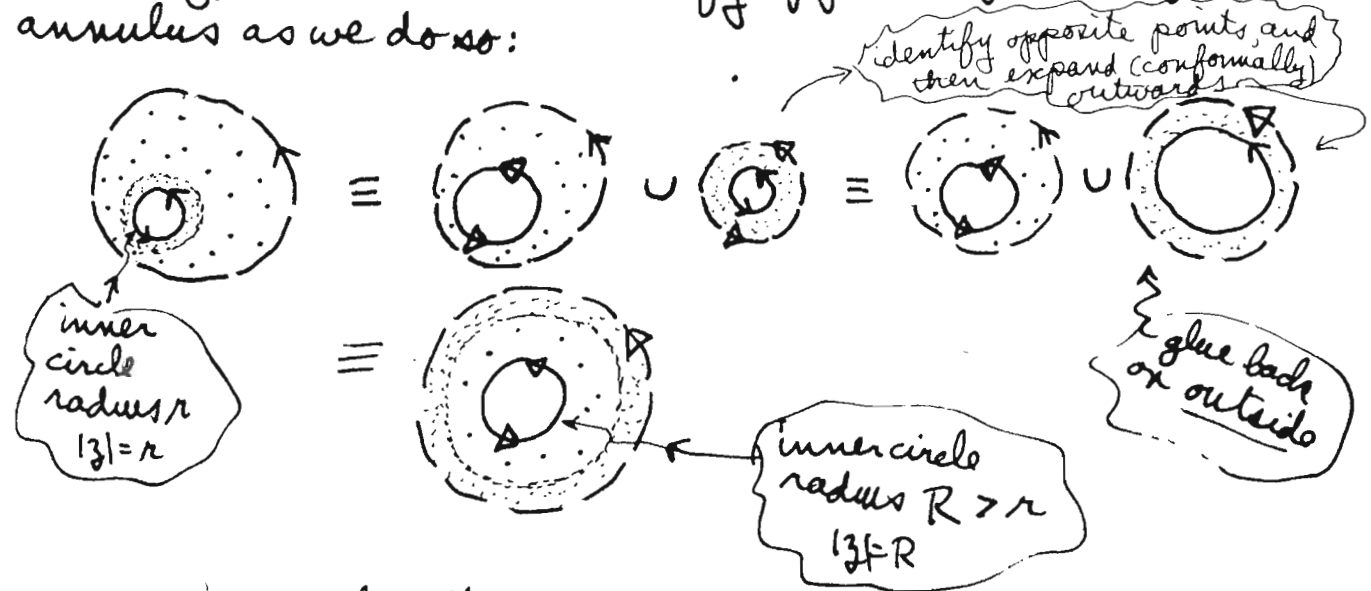just constructed, we can remove a small annulus from the inner circle boundary and glue it on at the outer circle boundary, but we must identify opposite points of this annulus as we do so:

identify opposite points and then expand (conformally) outwards

inner circle radius r $|z| = r$

glue back on outside

inner circle radius $R > r$ $|z| = R$

Also, we can perform this operation in reverse so long as there remains room on the inside.

If c is in the Mandelbrot set M, then the topological structure of S (under this equivalence) appears to differ in an essential way from when c is not in M. For in some sense S has a "covering space" which is the complement K of the Julia set in $\mathbb{C}$, and whether c is in M or not depends on the multiple-connectivity properties of K. (When $c \notin M$, K has a Cantor set removed from it, but when $c \in M$, K is topologically an annulus.)

Some clarifying ideas seem to be needed.

Roger Penrose

Advertisement: