

COMPLEX NUMBERS

PROBLEM 3: ANOTHER LOOK AT JULIA SETS

Explore iterations of the function $f(Z) = Z^2 - .75$, for complex values of Z . Begin with small values of Z (e.g., $.2 - .3i$) and see if you can find some numbers that eventually converge, some that diverge, and some that do neither.

Then look for sites on the Internet or use other references to find some of the art associated with this and other similar functions. Using one of the many search engines available on the Internet, you should be able to locate several sites that concern this subject by looking for Julia sets or fractal art.

PROBLEM 4: AN EXPLORATION WITH IMPEDANCE

Using the formula for the total impedance in a parallel circuit, $Z_T = \frac{Z_1 Z_2}{Z_1 + Z_2}$,

rework the Car Speakers problem using values of $5 + 3i$ and $3 - 2i$. Then, try different complex numbers for Z_1 and Z_2 . Make a conjecture about the input numbers that will produce a real value for the total impedance and about the input numbers that will produce a complex value for the total impedance.