Two-Variable Function Pump Exploration Questions

To understand the Mandelbrot set, we need to work with two-variable (complex) functions.

1. Practice your complex arithmetic by performing the following operations:

1.
$$(0,-1) + (1/2,1/3)$$

$$2. (.8,-.2) + (.1,-.3)$$

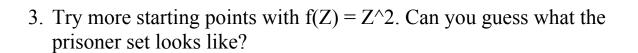
$$3. (0,1)^2$$

4.
$$(.8, -.3)^2$$

5.
$$(1,.2)^2 + (-.2,.5)$$

6.
$$(.5,.5)^2 + (.5,.5)$$

2. Iterate the function: $f(Z) = Z^2$ with the starting points (0,0), (1,0), (.5,.5), and (1,1). Calculate enough iterations for each to tell if it is a prisoner, escapee or neither.



4. Explore the function $f(Z) = Z^2 + (.5,.5)$ by choosing 10 starting values. Record your results. Can you find any prisoners?

5. Experiment with other C values, checking at least 5 starting points for each, and record your results.