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.

3. Try more starting points with f(Z) = Z^2. Can you guess what the prisoner set looks like?

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.