Spring 2010 Polynomials Homework-Assignment 3   Name: _____
Write-up your solution carefully including all the details of the proof. Due Tu, Oct 5.
Please staple your assignment.

(1) (5 points) Compute the center of mass of $1 + i, 1 - i, 2 - 3i, 7i$ with respect to $2i$.

(2) (5 points) Compute the center of mass of the roots of $x^3 - x + 1$ with respect to i.

(3) (5 points) Construct an example of a polynomial of degree f at least 3 such that it has one simple root z_0 with the property that $f''(z_0) \neq 0$.

(4) (5 points) Let $f(x) = x^3 - 2x^2 + 1$ and γ be a circle that passes through 1 and contains integer 3. Show that at least one of the roots for f is strictly inside γ.

(5) (5 points)(graduate students)
   Use Laguerre's criterion to show that some of the roots of $f(z) = z^3 - z^2 + z - 1$ are not real.