MAT 121-G11 – Spring, 2012 Test 3 Take-Home
Chapter 3 – 20 pts Name_____
Due Thursday, March 22nd.

I want to make this short and sweet:

Let $f(x) = x^5 - 9x^4 + 31x^3 - 35x^2 - 24x + 52$

1. Find all real and nonreal zeros of f.
2. Factor f over the real number field. This will involve an irreducible quadratic factor.
3. Factor f over the complex number field. This will involve factoring that irreducible factor, by use of the *nonreal* zeros of f.
4. Sketch the graph of f. Show all intercepts. I'm more interested in the graph being smooth than in seeing you count to 78 on the *y*-axis. So if your graph is all straight up-and-down, then you tried too hard to be accurate and lost the essence of what we're looking at. Polynomials are smooth functions.

I'm really looking for how you use the Rational Zeros Theorem, Factor Theorem, and synthetic division to break f down, step by step.

You can save yourself a LOT of time by using the free online grapher or your own graphing calculator to quickly locate the real zeros and their type.