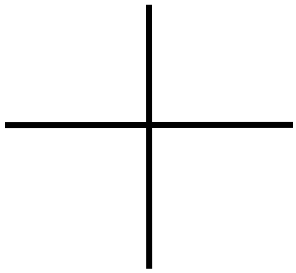
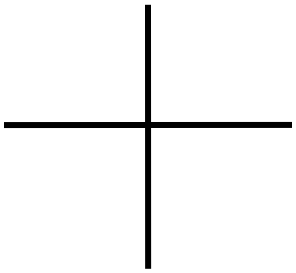
MAT 121-G11 – Fall, 2011 Test 3 Take-Home
Chapter 3 – 30 pts Name_____
Due Wednesday, October 26th

1. (5 pts) For each of the following polynomials, draw the end behavior on the graph.

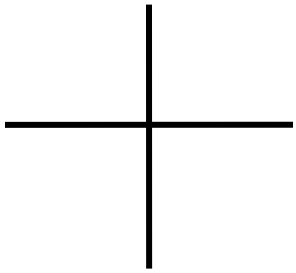
a. $p(x) = 5x^4 - 4x^3 + 2x - 5$



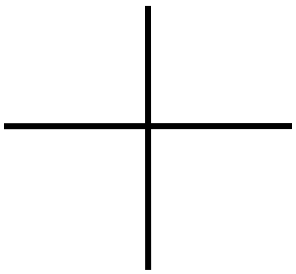
b. $g(x) = -5x^5 + 3x^4 - 5x^2 + 7x - 2$



c. $h(x) = -x^6 - 4x^3 + 2x^2 - 8x + 1$



d. $f(x) = 2x + 7$



Let $f(x) = x^5 - 6x^4 + x^3 + 56x^2 - 60x - 208$ for problems 2 - 6.

2. (5 pts) What does Descartes Rule of Signs tell you about this function?

3. (5 pts) Use the Rational Zeros (Roots) Theorem to list the possible rational zeros of f.

4. (5 pts) Find all real and complex zeros of $f(x) = x^5 - 6x^4 + x^3 + 56x^2 - 60x - 208$, using the rational zero candidates you have from the previous problem. Put your work NEATLY in the space below**. This means doing your work on separate paper, organizing it, and transferring it to the space, below, after you've eliminated the bad guesses. No credit for sloppy work.**

5. Now that you've done all the prep work, write f in factored form, in two ways:

   a. (3 pts) Factor f over the REAL number field (Involves an *irreducible quadratic* factor.).

   b. (2 pts) Factor f over the COMPLEX number field. (All *linear* factors.).

6. (5 pts) Now that you've factored it, I want you to sketch the graph of $f(x) = x^5 - 6x^4 + x^3 + 56x^2 - 60x - 208$, showing all intercepts. A *smooth* graph is the goal, here, not a graph that's a slave to the scale.