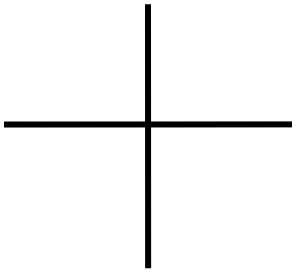
College Algebra MAT 121 Test 3 Name_____
Take-home portion
20 Points

Bring the completed test with you to the Testing Center by or before the Test 3 Deadline.

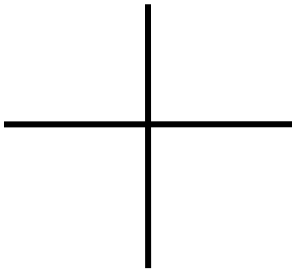
1. What is a zero of a polynomial? What is the difference between a real zero and a complex zero? What does this mean with respect to the graph?

2. For each of the following polynomials draw the end behaviors on the graph.

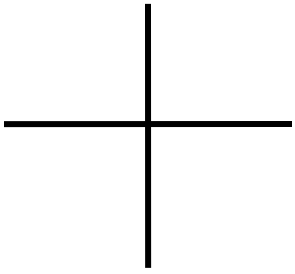
a. $f(x) = -4x^5 - 3x^4 + 2x + 7$



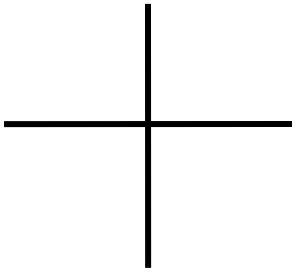
b. $g(x) = 3x^4 - 5x^2 + 7x - 2$



c. $p(x) = -2x^6 + 5x^4 - 4x^3 + 2x - 5$



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



For problems 3 through 10: Given the polynomial

$$f(x) = x^5 - 4x^4 + 2x^3 + 12x^2 - 24x + 16 .$$

3. What does Descartes Rule of Signs tell you about the zeros of this function?

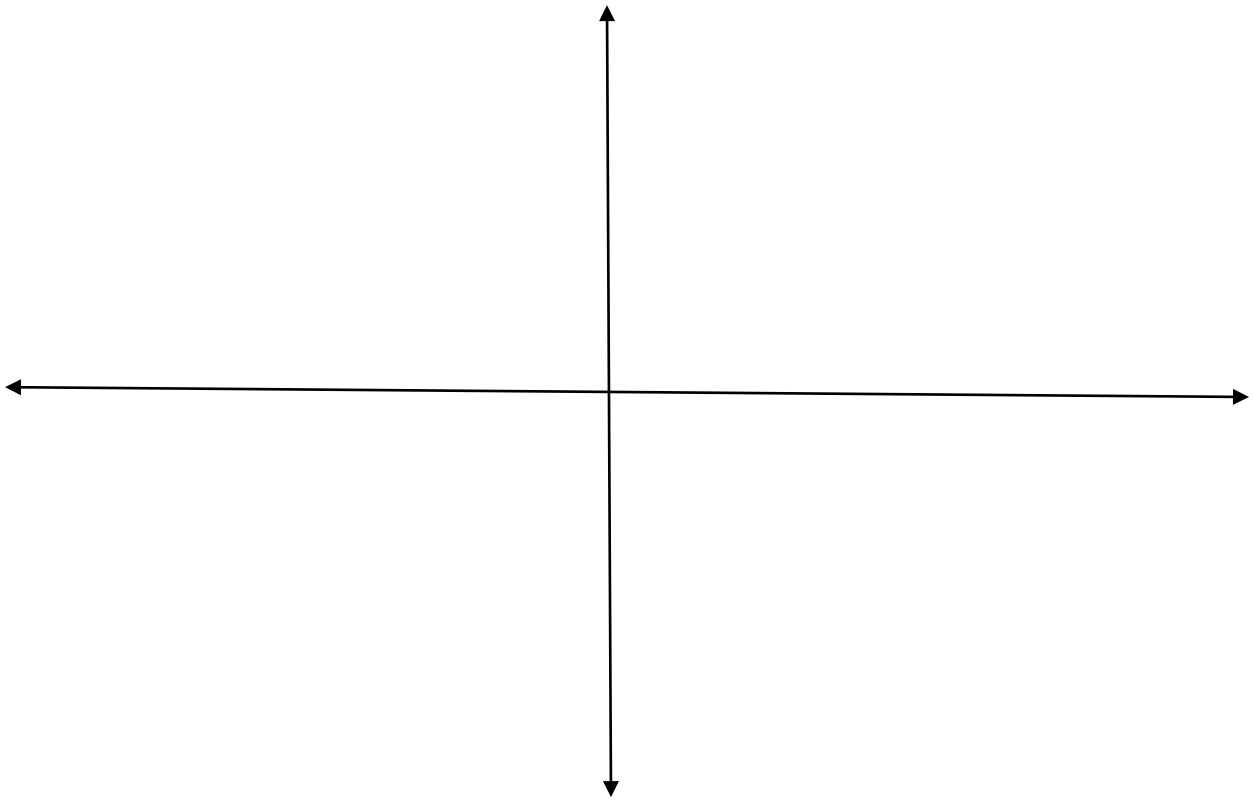
4. Use the Rational Zero (Root) Theorem to list the possible rational zeros.

5. Find all real and complex zeros of $f(x)$ Show all work. If it takes another page (or more) of work, then insert that page after this page.

6. Write $f(x)$ in factored form. (Factor the complex numbers.)

7. How do you find the y intercept and what is it?

8. Sketch the graph of $f(x)$.



9. Discuss how your graph supports the conclusions from questions 2 through 6.

10. Use other methods to further verify your graphical results.