REVIEW FOR TEST 2 OF MATH 121 :

The first and best line of defense is to complete and understand the homework and lecture examples. In particular you should focus on the homework and examples from lecture which concerned the following questions or tasks:

1. Be able to find the domain of a function.(2.2)
2. Know the definition of a function and how that relates conceptually to the vertical line test.(2.2)
3. Be able to interpret case-wise defined functions.(2.2)
4. Be able to determine domain and range of a function from a given graph.(2.3)
5. Be able to read zeros for a function from its graph.(2.3)
6. What is the "standard form" of a quadratic function? Be able to write quadratics in standard form. Be able to find the vertex on a graph. Be able to find the vertex from the equation of a quadratic polynomial (see E144 and surrounding notes and 3.1 non-word problem problems)
7. Given a vertex and a point on the graph of a quadratic function be able to find the formula for the quadratic function in standard form (3.1)
8. Know how to transforms graphs by horizontal or vertical shifts and/or horizontal or vertical reflections. Be able to write formulas and modify graphs (2.5)
9. Know how to construct new functions from old. In particular know how to calculate the sum, difference, product, quotient and composite of two given functions (2.6)
10. Given the formula for $f(x)$ find the formula for $f^{-1}(x)$. (2.7)
11. Given the graph $y = f(x)$ be able to plot the graph $y = f^{-1}(x)$. (2.7)
12. Given real zeros, some perhaps repeated, be able to give formula for a polynomial $f(x)$ which has those zeros. (3.2 and 3.4)
13. Given a graph with some crossings and some bounces be able to identify potential formulas which could have produced the graph. (3.2 and 3.4)
14. Given a polynomial $f(x)$ be able to check if $(x - a)$ is a factor of $f(x)$.
15. Given that a polynomial $f(x)$ has a zero be able to use the factor theorem plus long division to help you completely factor the graph. (E163-E167 show long division, homework from 3.4 where you had to completely factor something ugly almost always was based on this idea.)
16. Given that a polynomial $f(x)$ has a complex zero what can you say? Be able to use one complex zero to help factor a real polynomial. (this was 3.4 #48, 50, 54 for example)
17. Understand the connection between factoring and finding zeros. What can you say about complex zeros of a real polynomial?

18. Be able to solve quadratic equations. You need to memorize the quadratic formula, but I would strongly advise only using it as a last resort. Factoring or taking the square root are easier when they work. (see section 1.4#10, 24 or section 1.5 #66)
19. **There are 19 problems worth between 2 and 10 points. Mostly they are worth 5pts. The breakdown of the test is fairly close to this review sheet. Feel free to email me if you want further clarification on any point. Monday will be a review for the test. Thanks and have a great weekend, James.**