Take home Quiz 5 - Linear Algebra Summer 2010 **NAME:**

Due Thursday, June 17. To receive credit you MUST SHOW ALL YOUR WORK.

1. (15 pts) This is a continuation of Problem 27, page 273 textbook that we did in class.

Consider the vector space $C[-1,1]$ with the L^2-inner product

$$< f, g >= \int_{-1}^{1} f(x)g(x)\, dx\ .$$

(a) Find an orthonormal basis for the subspace $S = Span(1, x, x^2)$. (Look at Thm. 5.6.1 if you did not follow the hints given in class.)

(b) Find the best least squares approximation to $x^{1/3}$ on $[-1,1]$ by a quadratic function $q(x) = c_0 + c_1x + c_2x^2$.

2. (10 pts) Pb. 14 page 244 textbook. Look at Application 3 on pages 242-243. Feel free to use MATLAB to solve the normal equation

$$A^TA\mathbf{x} = A^T\mathbf{b} \quad \text{that you get in this case.}$$