MATH 301 – Quiz 7

You may work with other class members on this quiz, but you may not receive assistance from people not in MATH 301. You must show all of your work to receive full credit. Do all your work on other sheets of paper and be sure to staple all the pieces of paper together or YOU WILL GET A ‘ZERO’ ON THE QUIZ. Do not use decimal approximations unless asked to do so. Your work on this quiz must be handed in by Tuesday, 18 March 2003 at 1:40 p.m. GOOD LUCK!

1) Let $F : \mathbb{R}^n \to \mathbb{R}^n$ and $G : \mathbb{R}^n \to \mathbb{R}^n$ be linear transformations. Define the transformation $D : \mathbb{R}^n \to \mathbb{R}$ by $D(v) = (F(v))^T G(v)$ for all $v$ in $\mathbb{R}^n$. Is $D$ a linear transformation? Prove your answer.

2) Do Exercise 49 in Section 3.7.

3) Do Exercise 6 in Section 3.8. Feel free to use Matlab to assist your computations.

4) Do Exercise 15 in Section 3.8. What is the significance of this exercise? (Hint: research the “Method of Least Squares” in a good introductory calculus text, such as the one by Stewart (which BSU uses for its calculus classes).)