Math 221 202 **(Take home) Quiz 9 Cover-sheet** **Score** | |

Your name _____ **Student #** | | | | | | | | |

Due: Thursday, March 29th, 2001 at 10.00am.

(*Please read carefully*)Ground Rules:

0. Donot pick up a quiz for someone else unless they plan to be in class later today.
1. Open book and notes. You may consult anyone you want, but you must write up your own solutions.
2. Show your work. Explain your solutions clearly.
3. When you submit the quiz back on Tuesday, please use this cover sheet as the first page.
4. The grader will choose two problems randomly (page 3) and grade them.
5. Maximum possible score will be 25. There will be 4 points for completion and 1 point for attaching this cover sheet. No points for turning in this cover sheet without the quiz.
6. Please turn in the quiz in person as you enter the class (no later than 10.15 am)

It would be nice if you use the space below and the back of this page to answer the problems (page 3). It will minmize my/our contributions to global warming.

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Total	

[1] **Office hours:** Monday 1:30pm-3pm, 5pm-6pm, Wednesday 2:30pm-3:30pm, Thursday at 1:30pm-3:00pm, Friday 11:30am-12:30pm or by appointment. ○

Overview of Sections 6.1,6.2,6.3,6.4,6.5

1. **Vocabulary List:**
   (a) Inner product.
   (b) Length, distance between two vectors.
   (c) Orthogonal vectors.
   (d) Orthogonal sets, basis.
   (e) Orthogonal projection, orthogonal component
   (f) Gram-schmidt
   (g) QR factorization
   (h) Least squares solution
   (i) Least squares error
   (j) Ill-conditioned.

2. **Key Concepts:**
   (a) Distance and length between two vectors.
   (b) Orthogonal decomposition.
   (c) Theorem 10,11.
   (d) Gram schmidt process.
   (e) Least squares solution.

3. **Skills to Master:**
   (a) Computing Inner product, distance between two vectors.
   (b) Computing Whether two vectors or a set is orthogonal.
   (c) Computing angle between two vectors.
   (d) Decomposing a vector into two components for a given subspace W.
   (e) Using Gram-schmidt process.
   (f) Computing Least-squares solution.

On the circle at the bottom of page 1, mark -A if you read this page always, T- if only before triterms, if you did not read it thats fine, the circle will be empty. I just want to see how many of us find this page useful.

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Homework

Homework Set no.	Date	Section	Problems
Homework 22	March 23rd, 2001	6.1	1,3,7,13,19,31,11,17,20,26
		6.2	1,5,9,11,13,15,21,23
Homework 23	March 27th, 2001	6.3	1,3,7,11,15,19,21
		6.4	1,3,7,9,13
		6.5	1,3,5,11,15,19

Quiz 9 Questions

1. Section 6.1: 17,30.
2. Section 6.2: 3,14,17,23.
3. Section 6.3: 1,18,19.
4. Section 6.4: 3,9,13.
5. Section 6.5: 1,11.
6. Let $v_1 = \begin{bmatrix} 1 \\ 2 \\ 2 \end{bmatrix}, v_2 = \begin{bmatrix} 2 \\ -2 \\ 1 \end{bmatrix}, y = \begin{bmatrix} -5 \\ 2 \\ 5 \end{bmatrix}$.
   (a) Are v_1, v_2 orthogonal to each other ?
   (b) Find $\hat{y}$=proj$_W y$ the orthogonal projection of y onto W.
   (c) Explain geometrically the significance of $\hat{y}$