Name:

Math 254 Fall 2012 Exam 5

Please read the following directions:
Please print your name in the space provided, using large letters, as "First LAST". Books, notes, calculators, and other aids are not permitted on this exam. Please write legibly, with plenty of white space. Please put your answers in the designated areas. Show all necessary work in your solutions; if you are unsure, show it. Cross out work you do not wish graded; incorrect work can lower your grade. All problems are worth 5-10 points; your total will be scaled to the standard 100 point scale. You have approximately 30 minutes.

Extra credit may be earned by handing in revised work in class on Friday 10/19; for details see the syllabus. You will find this exam on the instructor's webpage soon.

1. Carefully state the definition of "independent". Give two examples from $P_2(t)$.

2. Let S be the set of all symmetric 2×2 matrices; it turns out that S is a subspace of $M_{2,2}(\mathbb{R})$. Find the dimension of S, and a basis for S.

The last three problems all concern $A = \begin{bmatrix} 1 & -3 & 0 & 4 \\ 2 & 0 & 6 & 3 \\ 3 & 1 & 10 & 2 \\ 4 & -7 & 5 & 1 \end{bmatrix}$, which is row equivalent to $B = \begin{bmatrix} 1 & 0 & 3 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$.

3. What can you conclude about $Span(\{(1,-3,0,4),(2,0,6,3),(3,1,10,2),(4,-7,5,1)\})$?

4. What can you conclude about $Span(\{(1,2,3,4),(-3,0,1,-7),(0,6,10,5),(4,3,2,1)\})$?

5. Find a basis for the solution space of the homogeneous system of equations $A \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = 0$.