Math 22 Lin Alg: Homework 6

due Wed Aug 2 . . . but best if do relevant questions after each lecture

Unless a question says 'matlab', please do it by hand first (you can always use matlab to check). It is important you keep up the skills for exams.

3.2: (see Goals listed in HW5)

45 (some matlab practise; *e.g.* see the code from 7/25/06 for making random matrices. What is the rule giving the number of pivots in $A^T A$ and AA^T ?).

4.2: (see Goals listed in HW5)

25, 39 (more matlab; you have all the clues for what to do already).

4.3: Goals: Know the definition of basis and examples; be able to check whether a given set of vectors forms a basis; be able to find a basis for a given space; know how to use the Spanning Set Theorem.

3, 9, 13 (the work has been done; you have to interpret it), 22, 24 (important one, please use a rigorous explanation that works for any n).

4.4: Goals: Understand the Unique Representation Theorem; find the change-of-coordinates matrix from the standard basis of Rn to a vector space with basis B and use it to convert from standard coordinates into B-coordinates and back again.

2, 12 (you may want to check that solving by row reduction agrees), 16 (as always, read super carefully!), 30.

4.5: Goals: Know the definition of dimension; understand the Basis Theorem and how it simplifies verification of the conditions for a basis; be able to find the dimensions of the Null Space and Column Space of a matrix and how they are related.

8 (Hint: is it Nul or Col of any matrix?), 14 (easy but important), 22.

4.6: Goals: Know the definition of the row space of A and how to find a basis for it; know the relations among the dimensions of Col(A), Row(A), and Nul(A) and the Theorem on Rank.

3, 8, 14.