1. Exam 3 is Thursday, June 19. It covers sections 1.7, 1.9, 3.2, 3.3, 3.4 and 3.5.

2. Be able to define “column space”, “null space”, “basis”, “dimension”, “linearly independent”, “span”, “linear combination”, “nonsingular”.

3. Be able to state and use the theorem about the linear dependence/independence of \( p \) vectors in \( \mathbb{R}^m \). (I call this the Short Fat Theorem.)

4. Be able to state and use four theorems about dimension.

5. Be able to state and use the Non-singular Matrix Theorem. (I have also called this the Invertible Matrix Theorem.) This result consists of a huge number of equivalent statements.

6. The material on the old exams which is covered on your exam 3:
   (a) Exam 1’s:
       97: 3, 4, 6, 8, 9, 10.
       01: 8, 9, 10.
       02: 4, 5, 6, 8, 10.
       Spring 03: 3, 4, 5, 6, 9, 10.
   (b) Exam 2’s:
       97: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
       98: 2, 3, 4, 7, 8, 9, 10.
       01: 1, 2, 8, 9.
       02: 6.
       Spring 03: 1, 2, 3, 4cde, 5, 6, 7, 8.
       Summer 03: 1, 2, 3, 5, 6, 7, 8, 10.
   (c) Exam 3’s:
       97: 1, 3, 4, 5, 6, 7, 8.
       98: 1, 2, 3, 4, 5, 6, 7, 8, 9.
       01: 3, 4, 5, 8, 9.
       02: 1, 2, 3, 7, 8, 9, 10.
       Spring 03: 1, 2, 3, 6, 7*, 8, 9*.
   (d) Exam 4’s:
       98: 2, 4, 5, 7.
       01: 1, 2, 3, 4, 5, 8, 9, 10.
       02: 2, 8, 9.
       Spring 03: 8.
   (e) Final Exams:
       97: 1, 3, 4, 6, 7, 8 (Notice that \( A \) and \( b \) for 6, 7, and 8 are given above problem 6.), 13, 15, 16.
       98: 1, 2, 7, 11, 14, 17.
       01: 1, 2, 3, 4, 7, 8, 9, 10abcd, 13.
       02: 1, 3, 8 (You can ignore “Solve \( Ax = b \).”), 11, 16.
       Spring 03: 10, 11, 12, 18.

* If \( A \) is a matrix, then the rank of \( A \) is the dimension of the column space of \( A \) and the nullity of \( A \) is the dimension of the null space of \( A \).