Linear Algebra and its Applications, Spring 2013
Homework 6

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Note 1. This homework is due ***8:30 am, October 22, 2013***. Please submit a hard copy into the homework box outside the TAs' lab.

Note 2. "Problem sets" should be found in the textbook (the fourth edition).

1. (10 points) Problem 31 in Problem set 3.1.
2. (10 points) Problem 38 in Problem set 3.1.
3. (10 points) Problem 50 in Problem set 3.1.
4. (10 points) Problem 52 in Problem set 3.1.
5. (10 points) Problem 8 in Problem set 3.2.
6. (10 points) Problem 19 in Problem set 3.2.
7. (10 points) Problem 6 in Problem set 3.3.
8. (10 points) Problem 11 in Problem set 3.3.
9. (20 points) Rigorously prove that the A^TA is invertible if and only if A has independent columns.

   Hint. First prove that A^TA and A share the same nullspace. Then prove the desired result.

   Note. It is fine to follow the slides of the textbook, as long as you use your own words and notations. Note that you need to prove an "if and only if" statement, not just an "if" statement.