Math 430 Fall 2016 Homework #5

Due Oct. 11, Tue in class

1. Textbook, Section 4.4, page 206: 1, 8, 9;
2. Let A be an $m \times n$ real matrix.
   (1) Show that if $Ax = 0$ for any $x \in \mathbb{R}^n$, then $A = 0$.
   (2) Show that if $A^T A = 0$, then $A = 0$. (*Hint*: use (1).)
3. Let V be the space of all 2×2 upper triangular matrices (which has been shown in HW#3).
   (1) Find a basis of V, and prove that your finding is indeed a basis of V.
   (2) Find the dimension of V.
4. Let V be a 2-dimensional vector space. Show that if $\{u, v\}$ spans V, then $\{u, v\}$ is linearly independent.