Math 215 HW #6

Due 5:00 PM Thursday, March 18

Reading: Sections 3.1–3.2 from Strang's *Linear Algebra and its Applications*, 4th edition.

Problems: Please follow the guidelines for collaboration detailed in the course syllabus.

1. Problem 3.1.14.
2. Problem 3.1.20.
3. Problem 3.1.28. Note: the last sentence in the statement of the problem is just an observation, not something you need to show separately.
4. Problem 3.1.36. A restatement of the problem: Suppose $\mathbf{V}$ is a p-dimensional subspace of $\mathbb{R}^n$ and that $\mathbf{W}$ is a q-dimensional subspace of $\mathbb{R}^n$. Moreover, suppose that $\mathbf{V}$ and $\mathbf{W}$ are orthogonal as subspaces of $\mathbb{R}^n$. What must be true of the quantity $p + q$?
5. Problem 3.1.42.
6. Problem 3.1.46. ("Mutually perpendicular" means that each column is perpendicular to all of the other columns)
7. Problem 3.2.8. In the parenthetical comment, the bond angle is the angle formed by the bonds between the carbon atom and two different hydrogen atoms...in other words, the same angle whose cosine you're trying to determine (note that this means you can check whether your answer is correct).
8. Problem 3.2.14.
9. Problem 3.2.18.
10. Problem 3.2.24. The vectors a_1, a_2 and b are shown in a figure on the bottom of page 159.