Math 215 HW #4
Due 5:00 PM Thursday, February 18

Reading: Sections 2.1–2.2 from Strang's *Linear Algebra and its Applications*, 4$^{\text{th}}$ edition.

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

1. Problem 2.1.6.

2. Problem 2.1.12.

3. Problem 2.1.18.

4. Problem 2.1.22.

5. Problem 2.1.28.

6. Problem 2.2.6.

7. Problem 2.2.20.

8. Problem 2.2.30.

9. Problem 2.2.62.

10. Suppose x_p is a vector in $\mathbb{R}^n$ such that

$$Ax_p = b,$$

where A is a given $m \times n$ matrix and b is a given vector in $\mathbb{R}^m$. Prove that, if x is any solution to the equation $Ax = b$, then
$$x = x_p + x_h,$$
where x_h is some element of the nullspace of A.