**Due:** upload to Gradescope by Friday 18 October 2019 at 3pm.

**Reading:** Chapter 2.1 – 2.4 from the textbook.

Grading: 1 point per exercise for completeness. The exercises marked with a $(\star)$ will also be graded for correctness, and will be assigned an additional 3 points each.

Submit written solutions to the following questions.

**Q1** Let $T\colon \mathbb{R}^m \to \mathbb{R}^n$ be any linear transformation, and denote by $\mathbf{0}_m$ the origin of $\mathbb{R}^m$, that is, this is the vector in $\mathbb{R}^m$ with all entries equal to zero. Show that $T(\mathbf{0}_m) = \mathbf{0}_n$.

**Q2** Show that the composition of two linear transformations is a linear transformation.

**Q3** Give an example of two linear transformations of the plane such that the matrices that represent the transformations do not commute.

Submit written solutions to the following exercises from the textbook:
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**Chapter 2.1:**
Ex. 2
Ex. 4($\star$)
Ex. 5

**Chapter 2.2:**
Ex. 2($\star$)
Ex. 20

**Chapter 2.3:**
Ex. 2($\star$)
Ex. 3
Ex. 7
Ex. 17
Ex. 55

**Chapter 2.4:**
Ex. 1
Ex. 11
Ex. 12
Ex. 29($\star$)