MA 2073. HOMEWORK 7
DO NOT HAND IN

Problems from text:

Section 6.7: 1, 3, 4, 11, 15

Section 7.1: 3, 6, 7, 8, 10, 14, 17, 18

Section 7.2: 1, 2, 5, 6, 7, 10, 11, 21, 26, 27, 32

Additional problems:

1. Suppose A is square and invertible, with the singular value decomposition $A = U\Sigma V^T$. Find a singular value decomposition of A^{-1}.

2. Show that the columns of V are eigenvectors of A^TA and the columns of U are eigenvectors of AA^T. (*Hint:* use the SVD to compute A^TA and AA^T.

3. Show that the map $T : M_{n\times n} \to \mathbb{R}$ defined by $T(A) = trace(A)$ is a linear transformation.

4. Show that the map $D : M_{n\times n} \to \mathbb{R}$ defined by $D(A) = det(A)$ is *not* a linear transformation.