

Homework 1, due Friday 9/2

1. p. 3, problem 4
2. p. 7, problems 3 (a), 7 (a), 11 (a)
3. Evaluate the following.
 - (a) $\begin{pmatrix} 0 & 1 & -1 \\ 2 & 3 & 1 \end{pmatrix} \begin{pmatrix} 1 \\ 2 \\ e \end{pmatrix}$
 - (b) $\begin{pmatrix} 1 & 2 \\ 2 & 1 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} -1 & 1 \end{pmatrix}$
4. p. 16, problem 2 (a), (b), (d)
5. (a) Let A, B be square matrices of the same size. Show that $(A+B)^2 = A^2 + AB + BA + B^2$.
(b) Give examples of 2×2 -matrices A and B such that $(A+B)^2 \neq A^2 + 2AB + B^2$.
6. Let $A = \begin{pmatrix} 1 & 2 \\ 0 & 2 \end{pmatrix}, B = \begin{pmatrix} 1 & 0 \\ 2 & 1 \end{pmatrix}$. Show that $(AB)^2 \neq A^2B^2$.
7. Let $A = \begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$. Compute A^2 and compare with $-I_2$.
8. p. 29, problems 4, 9 (b), 10 (a)
9. Let A be a non-singular matrix, show that A^{-1} is non-singular and that $(A^{-1})^{-1} = A$.
10. p. 30, problems 11, 20