

Homework Sets 6 – 10

All problems given by number are from *Linear Algebra with Applications*, 8th or 9th edition, by Steven Leon.

Notation: the book writes column vectors $\begin{pmatrix} x \\ y \\ z \end{pmatrix}$ horizontally as $(x, y, z)^T$ to save space.

Caution: For those using Leon's 8th edition, the Section 3.2 Problems 18, 19ab, 21, 23 and 24 below correspond to Problems 15, 16ab, 18, 20 and 21 in the 8th edition (no change needed for Sections 3.1 or 3.3).

Class Date	Section covered	HW assigned
Wednesday Sept 12	1.5	<p>Do Supplemental Problem 5 below. Then do Section 1.5 Problems 10h, 11, 12abc, 23, and 24.</p> <p><i>Suggestions:</i> for both 23 and 24a), use the fact that if $A \cong B$ then $B = E_k E_2 \cdots E_1 A$ for some elementary E_i. For 24b), use 24a) and that fact that A is invertible if and only if $A \cong I_n$.</p>
Friday Sept 14	3.1	<p>4 and 6. For (4), $\mathbb{R}^{m \times n}$ is the set of all $m \times n$ matrices. <i>Use the algebraic properties listed in Theorem 1.4.1 on page 47.</i></p> <p>Then start the “Vector Space Axioms HW” on the last page of the handout by giving complete proofs to Lemmas 6, 7, and 8.</p>
Monday Sept 17	3.2	<p>Finish the Vector Space Axioms HW.</p> <p>Then do problems 1bc, 2ac, 3adf, 5a, and 6a in Section 3.2.</p>
Wednesday Sept 19	3.2	<p>Prepare for exam – see the Review Sheet. The exam covers Sections 1.1–1.5, 3.1, and the part of 3.2 done on vector subspaces (but not the part on span).</p>
Friday Sept 21	Exam 1	<p>No Homework for the weekend.</p> <p><i>If you want to get ahead,</i> do Problems 11bc, 12a, 18, 19ab, 23, and 24 in Section 3.2 (these will be assigned on Monday).</p>

Supplemental Problem.

5. (a) Write $A = \begin{pmatrix} 3 & 1 \\ 9 & 5 \end{pmatrix}$ as a product of elementary matrices. (b) Write A^{-1} as a product of elementary matrices.