Homework Set 6

MATH 201 — WINTER 2015

Due Tuesday, February 24

Section 4.3
Problems 4, 8, 14, 16, 25.
Section 4.4
Problems 2, 8, 12, 14, 24.
Section 4.5
Problems 4, 8, 14, 18, 30.

PROBLEM 6.1. Let A be a 5×7 matrix with 3 pivots. Determine $\dim(\mathrm{Nul}(A))$ and $\dim(\mathrm{Col}(A))$.

PROBLEM 6.2. Let $A = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 2 & 2 \\ c & 3 & 3 \end{bmatrix}$. For each $c \in \mathbb{R}$ determine $\dim(\mathrm{Col}(A))$.

PROBLEM 6.3. Let $\mathbf{v}_1 = \begin{bmatrix} 3 \\ 1 \\ 2 \end{bmatrix}$, $\mathbf{v}_2 = \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$, $\mathbf{x} = \begin{bmatrix} 9 \\ 2 \\ 7 \end{bmatrix}$, and $\mathcal{B} = \{\mathbf{v}_1, \mathbf{v}_2\}$. Then $\mathcal{B}$ is a basis for $H = \mathrm{Span}\{\mathbf{v}_1, \mathbf{v}_2\}$. Determine if $\mathbf{x}$ is in H, and if it is, find the coordinate vector $[\mathbf{x}]_{\mathcal{B}}$ of $\mathbf{x}$ relative to $\mathcal{B}$.