Week 7
MATH 33A
TA: Jerry Luo
jerryluo8@math.ucla.edu
Website: math.ucla.edu/∼jerryluo8
Office Hours: Thursday 1PM-2PM, MS 2344
SMC hours: Tuesday 1-2PM, MS 3974

3.3.28 For which value(s) of k do the vectors below form a basis for $\mathbb{R}^4$?

$$\begin{bmatrix}1\\0\\0\\2\end{bmatrix}, \begin{bmatrix}0\\1\\0\\3\end{bmatrix}, \begin{bmatrix}0\\0\\1\\4\end{bmatrix}, \begin{bmatrix}2\\3\\4\\k\end{bmatrix}$$

3.3.36 Can you find a 3×3 matrix such that $Im(A) = \ker(A)$? Explain.

3.4.46 Consider the plane $x_1 + 2x_2 + x_3 = 0$. Find a basis β for this plane such that $[x]_\beta = \begin{bmatrix} 2 \\ -1 \end{bmatrix}$, where $x = \begin{bmatrix} 1 \\ -1 \\ 1 \end{bmatrix}$

3.4.53 Consider the following basis for $\mathbb{R}^2$: $\beta = \left\{ \begin{bmatrix} 1 \\ 2 \end{bmatrix}, \begin{bmatrix} 3 \\ 4 \end{bmatrix} \right\}$. Given $[x]_\beta = \begin{bmatrix} 7 \\ 11 \end{bmatrix}$, what is x?