Homework Problems

November 28, 2005

Exercise 1. Let

$$A = \begin{pmatrix} 2 & -3 & 6 & 2 & 5 \\ -2 & 3 & -3 & -3 & -4 \\ 4 & -6 & 9 & 5 & 9 \\ 2 & 3 & 3 & -4 & 1 \end{pmatrix}.$$

Find bases for $(\text{Nul } A)^\perp$ and $(\text{Col } A)^\perp$. *Hint:* Use Theorem 3 in section 6.1 together with the fact that $(W^\perp)^\perp = W$.

Exercise 2. Let

$$W = \text{Span} \left\{ \begin{pmatrix} 1 \\ -4 \\ 9 \\ -7 \end{pmatrix}, \begin{pmatrix} -1 \\ 2 \\ -4 \\ 1 \end{pmatrix}, \begin{pmatrix} 5 \\ -6 \\ 10 \\ 7 \end{pmatrix} \right\}.$$

Find bases for W and $W^\perp$. *Hint:* Write W as the column space of a matrix and use Theorem 3 in section 6.1.