King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

Semester (112) March 14, 2012

Math 260
Quiz 2

Name: .....

ID: .....

Exercise 1. Let

$$\mathcal{B} = \left\{ \begin{pmatrix} 2 \\ -1 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 \\ 3 \\ -1 \end{pmatrix}, \begin{pmatrix} 1 \\ -4 \\ -1 \end{pmatrix} \right\}.$$

(1) Show that $\mathcal{B}$ is a basis of $\mathbb{R}^3$.

(2) Find the vector coordinate $[v]_{\mathcal{B}}$ of $v = \begin{pmatrix} -1 \\ 1 \\ 0 \end{pmatrix}$.

Exercise 2. Find $\dim(\mathbf{NS}(A))$ and $\dim(\mathbf{CS}(A))$, where

$$A = \begin{pmatrix} 1 & 1 & 0 & 3 \\ 1 & 1 & 1 & -2 \\ 3 & 3 & 2 & -1 \end{pmatrix}.$$

Exercise 3. Let $f(x) = x^3$ and $g(x) = |x|^3$. Show that $w(f(x), g(x)) = 0$, for all $x \in \mathbb{R}$, but f and g are linearly independent.