QUIZ October 25, 2013

Clicker Instructions: A = True; B = False;
C = I don't know; D = No truth value
correct = 1pt; don't know = 0pt; wrong = 0pt

1. Let
$$\mathcal{B} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
be a basis for $\mathbb{R}^2$. Let $\mathbf{x} = \begin{pmatrix} 1 \\ 2 \end{pmatrix} \in \mathbb{R}^2$. Then
$$[\mathbf{x}]_{\mathcal{B}} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}.$$

2. Let
$$\mathcal{B} = 1 + t, t^2, 1$$
be a basis for $\mathbb{P}_2$. Let $\mathbf{x} = t + t^2 \in \mathbb{P}_2$. Then
$$[\mathbf{x}]_{\mathcal{B}} = \begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix}.$$

3. Let $\mathbf{u}, \mathbf{v}, \mathbf{w}$ be vectors in a vector space V. Suppose that $3\mathbf{u} + 4\mathbf{v} = \mathbf{w}$ and that $2\mathbf{u} + 10\mathbf{v} = \mathbf{w}$. Then it is impossible that $\mathbf{u}$ and $\mathbf{v}$ form a basis for the vector space V.

4. Let $\mathcal{B}$ be a basis for a vector space V. Then the mapping which takes any vector $\mathbf{x}$ in V to its coordinate vector $[\mathbf{x}]_{\mathcal{B}}$ relative to $\mathcal{B}$ is a linear transformation.