Math 54, Quiz 4 Spring 2007 GSI Carter

Name:

1. Answer the following statements "true" or "false."

   (a) The function $f : M_{33} \to \mathbb{R}$ given by $f(A) = \det A$ is a linear transformation.

   (b) The function $f : P_2 \to P_1$ given by $f(a_0 + a_1x + a_2x^2) = a_2x + 3$ is a linear transformation.

   (c) Let $\mathbf{u} \in \mathbb{R}^4$. Then the function $f : \mathbb{R}^4 \to \mathbb{R}$ given by $f(\mathbf{v}) = \mathbf{u} \cdot \mathbf{v}$ is a linear transformation.

2. Let $B = \{1, x, x^2\}$ and $C = \{1 + x^2, 1 - x^2, x - x^2\}$. Give the transition matrix from B to C (that is, the matrix P such that $P[q]_B = [q]_C$ for all $q \in P_2$).