Name: ____________________

Math 2250, Fall 2011, Quiz 9 **November 4, 2011** **R. Bruner**

Answer 'Y' (yes) or 'N' (no) to each of the following.
Use the usual addition and scalar multiplication in each.

Are these vector spaces?

Y $\{\begin{bmatrix} x \\ y \end{bmatrix} \mid 2x + 3y = 0\}$

N $\{\begin{bmatrix} x \\ y \end{bmatrix} \mid 2x + 3y = 5\}$

Y $\{\begin{bmatrix} 2a + 3b \\ a - b \end{bmatrix} \mid a, b \text{real}\}$

Y Polynomials of the form $ax^5 + bx^3 + cx^2$, with a, b and c real.

Y Degree 4 polynomials whose value at 1 is 0.

N Degree 4 polynomials whose value at 1 is 1.

Are these linear transformations?

N $T : \mathbf{R}^2 \longrightarrow \mathbf{R}^2$ by $T(\begin{bmatrix} x \\ y \end{bmatrix}) = \begin{bmatrix} x + y \\ xy \end{bmatrix}$.

Y $T : \mathbf{R}^2 \longrightarrow \mathbf{R}^2$ by $T(\begin{bmatrix} x \\ y \end{bmatrix}) = \begin{bmatrix} 2x + y \\ x - y \end{bmatrix}$.

Y $T : P_4 \longrightarrow \mathbf{R}^2$ by $T(p) = \begin{bmatrix} p(1) \\ p(2) \end{bmatrix}$.

Y $T : P_4 \longrightarrow P_3$ by $T(p) = p' - p(2)$.