MA 371 11/6/03 Quiz 8. **NAME:**

You may use a calculator, text and notes. Show all other work.

1. Consider the transformations $T_A : \mathcal{R}^2 \to \mathcal{R}^3$ defined by $T_A(x_1, x_2) = (2x_1 + 3x_2, -x_2, x_1 + 2x_2, -2x_1)$.

   (a) Find the standard matrix representation for T_A.

   (b) Find $T_A(4, 2)$

2. (a) Find the matrix representation of the operator on $\mathcal{R}^2$ which reflects in the line $y = x$ then projects onto the x-axis.

   (b) Find the image of $(0, 1)$ under this transformation.

3. Consider operator on $\mathcal{R}^2$ defined by $T(x, y) = (x, 2x)$

   (a) Find $ker(T)$

   (b) Describe geometrically $ran(T)$. **Hint:** If you can't do this by inspection, try plotting a few points in the range.