QUIZ #5, 9/11/07

MATH 54, FALL 2007

Show your work and justify your answers! Feel free to use both sides.

Name:

1. (4 pts) Find the matrix for the tranformation given by dilation (i.e. expansion) by a factor of 5 followed by a rotation counterclockwise by $\frac{\pi}{2} = 90°$. (Hint: if you get stuck, figure out what happens to the vector $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$ and what happens to the vector $\begin{bmatrix} 0 \\ 1 \end{bmatrix}$ and then use this to find the matrix.)

2. Setup: Draw some axes and draw the letter 'R' with its lower left corner at the origin (i.e. $(0, 0)$) and its left side along the y-axis.

(a) (2 pts) Now consider the matrix $A = \begin{bmatrix} 1 & 0 \\ 0 & -2 \end{bmatrix}$. Draw what happens to the 'R' if you apply this transformation and briefly describe it in words.

(b) (2 pts) Find A^{-1} (the inverse matrix).

(c) (2 pts) Draw what would happen to the original 'R' from the setup (use a different location on the page for this drawing) if you apply the transformation A^{-1}.