Quiz 4

Spring 2012

Math 0280 **Your name:** _____

1. [8 points] The transformation T stretches a vector by a factor of 2 in the x-component and by a factor of 3 in the y-component. Show that the transformation T from $\mathbb{R}^2$ to $\mathbb{R}^2$ is linear by showing that it is a matrix transformation.

2. [7 points] Using the definition of a linear transformation show that

$$T\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} x - y + z \\ 2x + y - 3z \end{bmatrix}$$

is a linear transformation.

bonus problem [5 points extra] Let l and m be two lines through the origin and F_l and F_m be the corresponding reflections (and linear transformations). Is $F_l \circ F_m$ also a reflection in a line through the origin. If it is then prove it, if it is not then give a counterexample.