**Name:**_____

**Quiz 6**; Friday, March 10

**MATH 54** with Prof. Sethian

**GSI:** Alex Carney

You have 15 minutes to complete the quiz. Calculators are not permitted.

1. (3 points) Find the eigenvalues and a basis for each corresponding eigenspace for the matrix

$$\begin{pmatrix} 0 & 0 & 2 \\ -3 & 1 & 6 \\ 0 & 0 & 1 \end{pmatrix}$$

2. (2 points) Write down the matrix for the linear transformation from $\mathbb{R}^2 \to \mathbb{R}^2$ which projects orthogonally onto the line $y = 2x$. Hint: what are the projections of the standard basis vectors?

3. (3 points) True or False:

   (a) An orthogonal set of vectors must be linearly independent

   (b) A set of eigenvectors with distinct eigenvalues must be linearly independent.

   (c) A set of eigenvectors with distinct eigenvalues must be orthogonal.