Quiz 8

1. (5 points) Let $\vec{v}_1 = \left(\begin{smallmatrix} 3 \\ 1 \end{smallmatrix}\right)$ and $\vec{v}_2 = \left(\begin{smallmatrix} 5 \\ 2 \end{smallmatrix}\right)$. Find a 2×2 matrix A such that $A\vec{v}_1 = 2\vec{v}_1$ and $A\vec{v}_2 = -\vec{v}_2$.

2. (5 points) For $A = \begin{pmatrix} 0 & 0 & 0 \\ 0 & 0 & 2 \\ 0 & 3 & 1 \end{pmatrix}$, find the (a) eigenvalues, (b) eigenvectors, and (c) diagonalization.

(For fun) Why do A and A^T have the same eigenvalues?