Name: _____

Section: _____

Important: For all three problems, let

$$A = \begin{bmatrix} -1 & 0 & -1 \\ 6 & 1 & 8 \\ 0 & 0 & 0 \end{bmatrix}$$

1. Find the eigenvalues of A and a basis for each eigenspace.

2. Find a matrix P such that $P^{-1}AP$ is diagonal.

3. Explain in a few words why you could have computed at least one of the eigenvalues of A without using the characteristic polynomial.