1. Find the eigenvalues and corresponding bases for the eigenspaces of

\[ A = \begin{bmatrix} 1 & -2 \\ 3 & 6 \end{bmatrix} \]

2. Let \( A \) be a \( 2 \times 2 \) matrix with eigenvectors \( u = (1, 1) \), \( v = (1, 0) \) corresponding respectively to the eigenvalues \( \lambda_1 = 2 \), \( \lambda_2 = -1 \). Use diagonalization to compute \( A^{10} \)