MATH 260, Linear Algebra, Spring '14
Activity 11: Diagonalization
Honor Code: **Names:**

Applications of Diagonalization: Matrix Powers

We are again going to use the matrix: $\mathbf{A} = \begin{bmatrix} 1 & 1 \\ 4 & 1 \end{bmatrix}$ with eigenvalues $\lambda_1 = 3$ and $\lambda_2 = -1$ with corresponding eigenvectors $\vec{v}_1 = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$ and $\vec{v}_2 = \begin{bmatrix} 1 \\ -2 \end{bmatrix}$ respectively.

12. Compute $\mathbf{PD}^2\mathbf{P}^{-1}$ and $\mathbf{A}^2$. What do you notice?

13. Compute $\mathbf{PD}^3\mathbf{P}^{-1}$. Is it equal to $\mathbf{A}^3 = \begin{bmatrix} 13 & 7 \\ 28 & 13 \end{bmatrix}$?

14. Give a general equation to compute $\mathbf{A}^k$.