MATH 100—HOMEWORK 06

NAME _____

> **Directions: please print this page, and put your solutions in the space provided.**
> If you need extra space, you can attach another sheet of paper.

1. Let $A = \begin{bmatrix} 2 & 3 \\ 4 & 1 \end{bmatrix}$.

    (a) Show that the eigenvalues of A are $\lambda = -2, 5$ using the characteristic polynomial.

    (b) Show that A is diagonalizable by finding a diagonal matrix D and an invertible matrix P such that $A = PDP^{-1}$. *Please show all work.*

$D =$ $P =$

2. Let $B = \begin{bmatrix} 4 & 0 & 0 \\ 2 & 5 & 4 \\ 0 & 0 & 5 \end{bmatrix}$.

(a) Show that the eigenvalues of B are $\lambda = 4, 5$ (5 has multiplicity 2) using the characteristic polynomial.

(b) Show that B is **not** diagonalizable. *Please show all work and explain your reasoning.*