## MATH 246 Homework 3.3

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## Directions:

- Work should be done neatly and on separate paper.
- Enough work must be shown so that the steps you are taking is clear.

1. For each of the following find examples of two $2 \times 2$ matrices $A$ and $B$ with $A \neq B$ such that:
(a) $A B=B A$
(b) $A B \neq B A$
2. Calculate the inverse of each of the following matrices. One has no inverse.
(a) $\left[\begin{array}{rr}-2 & 1 \\ 5 & 2\end{array}\right]$
(b) $\left[\begin{array}{rr}0 & 6 \\ 7 & -3\end{array}\right]$
(c) $\left[\begin{array}{ll}4 & 8 \\ 2 & 4\end{array}\right]$
3. Find the eigenvalues for each of the following matrices:
(a) $A=\left[\begin{array}{ll}1 & 2 \\ 3 & 2\end{array}\right]$
(b) $A=\left[\begin{array}{rr}3 & -2 \\ -1 & 4\end{array}\right]$
(c) $A=\left[\begin{array}{rr}3 & -2 \\ 1 & 4\end{array}\right]$
(d) $A=\left[\begin{array}{ll}0 & 1 \\ 2 & 2\end{array}\right]$
(e) $A=\left[\begin{array}{ll}3 & 0 \\ 4 & 3\end{array}\right]$
(f) $A=\left[\begin{array}{rr}5 & 4 \\ -25 & -15\end{array}\right]$
(g) $A=\left[\begin{array}{rr}4 & 0 \\ -1 & 4\end{array}\right]$
