MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECTION 3.4 **Math 2050 Worksheet** WINTER 2018

For practice only. Not to be submitted.

1. Find the eigenvalues and corresponding eigenspaces of each of the following matrices.

   (a) $A = \begin{bmatrix} 2 & -1 \\ 5 & -4 \end{bmatrix}$

   (b) $A = \begin{bmatrix} 3 & 2 \\ 6 & 4 \end{bmatrix}$

   (c) $A = \begin{bmatrix} 7 & 0 & -4 \\ 0 & 5 & 0 \\ 5 & 0 & -2 \end{bmatrix}$

   (d) $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 1 & 0 \\ 1 & -1 & 2 \end{bmatrix}$

   (e) $A = \begin{bmatrix} 2 & 1 & 1 \\ 0 & 3 & 0 \\ 1 & -1 & 2 \end{bmatrix}$

2. Let $\mathbf{x}$ be an eigenvector of an invertible matrix A, with corresponding eigenvalue λ. Prove that $\mathbf{x}$ is also an eigenvector of A^{-1}, and determine the corresponding eigenvalue, μ, in terms of λ.