

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

ASSIGNMENT 8

MATH 2050

WINTER 2018

Due: Monday, April 2nd, 2018. SHOW ALL WORK.

1. A and B are 5×5 matrices for which $\det(A) = 3$ and $\det(B) = -4$. Find $\det(2AB^{-1}A^TB^2)$.

2. Find the determinant of

$$A = \begin{bmatrix} 1 & -3 & -1 & 2 \\ -2 & 6 & 5 & 3 \\ -1 & 3 & -1 & 2 \\ 4 & -9 & 2 & 2 \end{bmatrix}$$

by reducing to upper triangular form.

3. Find the eigenvalues (both real and complex) and corresponding eigenspaces of each of the following matrices.

(a) $A = \begin{bmatrix} 3 & 1 \\ 2 & 4 \end{bmatrix}$

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

(c) $A = \begin{bmatrix} -1 & 2 & 3 \\ 1 & -2 & -1 \\ -2 & 4 & 4 \end{bmatrix}$

(d) $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & -3 & 5 \\ 3 & -5 & 3 \end{bmatrix}$

(e) $A = \begin{bmatrix} -5 & 8 & -8 \\ -4 & 7 & -4 \\ 0 & 0 & 3 \end{bmatrix}$

(f) $A = \begin{bmatrix} -5 & 8 & -8 \\ -4 & 7 & -4 \\ 0 & 0 & -1 \end{bmatrix}$