MATH 2050 **Assignment 8** **Fall 2018**

Due: Friday, Nov 22.

[10] 1. Find the determinant by reducing to triangular form for the following matrices.

(a) $A = \begin{bmatrix} 0 & -1 & 2 \\ 2 & 1 & 4 \\ 1 & -1 & 5 \end{bmatrix}$.

(b) $A = \begin{bmatrix} 1 & -1 & 2 & -2 \\ 2 & 5 & 3 & 1 \\ -1 & 0 & 2 & -1 \\ 3 & 1 & 2 & 0 \end{bmatrix}$.

[10] 2. Find the matrix M of minors and the matrix C of cofactors, compute the product AC^T and C^TA, calculate the determinant of A, and find A^{-1} if possible, for the following matrices

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

(b): $A = \begin{bmatrix} -1 & 2 & 5 \\ 3 & 5 & 2 \\ 4 & 8 & 9 \end{bmatrix}$.

[10] 3. Let $A = \begin{bmatrix} 1 & 2 & 0 \\ 0 & -3 & 5 \\ 6 & 4 & -1 \end{bmatrix}$.

(a): Find the determinant of A with a Laplace expansion down the first column.
(b): Find the determinant of A with a Laplace expansion down the second row.

[5] 4. Let A and B be 4×4 matrices with $\det(A) = 3$ and $\det(B) = 2$. Find the following determinants:

(a) $\det(B^{-1})$, $\det(A^3)$, and $\det(-4B)$;

(b) $\det(3B^{-1}A^2B^3A^{-1}B^t)$.

[5] 5. Let $A = \begin{bmatrix} a & b & c \\ p & q & r \\ x & y & z \end{bmatrix}$. Given that $det(A) = -5$, evaluate the following determinant:

$$\begin{vmatrix} a+2x & a+p & 2p+x \\ b+2y & b+q & 2q+y \\ c+2z & c+r & 2r+z \end{vmatrix}.$$

[5] 6. Calculate the determinant of $\begin{bmatrix} 1 & 2 & 3 & 4 & 0 \\ 2 & 6 & 5 & 14 & 8 \\ 13 & 12 & 12 & 13 & 2 \\ 4 & 5 & 8 & 3 & 5 \\ 5 & 10 & 15 & 20 & 0 \end{bmatrix}$.

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