# Homework 8

## 2.1

**3.** Let

$$A = \begin{bmatrix} 4 & -1 & 1 & 6 \\ 0 & 0 & -3 & 3 \\ 4 & 1 & 0 & 14 \\ 4 & 1 & 3 & 2 \end{bmatrix}$$

Find the following:

    **a.** $M_{13}$ *and* $C_{13}$.

    **b.** $M_{23}$ *and* $C_{23}$.

**11.** Use the arrow technique to evaluate the determinant of the given matrix.

$$\begin{bmatrix} -2 & 1 & 4 \\ 3 & 5 & -7 \\ 1 & 6 & 2 \end{bmatrix}$$

**18.** Find all values of $\lambda$ for which $\det(A) = 0$.

$$A = \begin{bmatrix} \lambda - 4 & 4 & 0 \\ -1 & \lambda & 0 \\ 0 & 0 & \lambda - 5 \end{bmatrix}$$

**21.** Evaluate $\det(A)$ by a cofactor expansion along a row or column of your choice.

$$A = \begin{bmatrix} -3 & 0 & 7 \\ 2 & 5 & 1 \\ -1 & 0 & 5 \end{bmatrix}$$

**31.** Evaluate the determinant of the given matrix by inspection.

$$\begin{bmatrix} 1 & 2 & 7 & -3 \\ 0 & 1 & -4 & 1 \\ 0 & 0 & 2 & 7 \\ 0 & 0 & 0 & 3 \end{bmatrix}$$

**38.** What is the maxiumum number of zeros that a $3\times3$ matrix can have without having a zero determinant? Explain your reasoning.

## 2.2

**14.** Evaluate the determinant of the given matrix by reducing the matrix to row echelon form.

$$\begin{bmatrix} 1 & -2 & 3 & 1 \\ 5 & -9 & 6 & 3 \\ -1 & 2 & -6 & -2 \\ 2 & 8 & 6 & 1 \end{bmatrix}$$

**27.** Evaluate the determinant given that

$$\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix} = -6.$$

$$\begin{vmatrix} -3a & -3b & -3c \\ d & e & f \\ g - 4d & h - 4e & i - 4f \end{vmatrix}$$

**29.** Use row reduction to show that $\begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ a^2 & b^2 & c^2 \end{vmatrix} = (b - a)(c - a)(c - b)$

**30.** description

**34.** description

## 2.3

**19.** description

**27.** description

**33.** description