

Worksheet 7

Sections 207 and 219
MATH 54

February 12, 2019

Exercise 1. Compute the determinant in your favorite way.

$$\begin{vmatrix} 3 & 3 & -3 \\ 3 & 4 & -4 \\ 2 & -3 & -5 \end{vmatrix}$$

Exercise 2. Suppose that we already know that:

$$\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix} = 7.$$

Compute the following determinant:

$$\begin{vmatrix} -5d + g & -5e + h & -5f + i \\ a & b & c \\ g & h & i \end{vmatrix}$$

Exercise 3. Determine the values of s such that the system has a unique solution. Use Cramer's rule to describe the solutions in terms of s .

$$3sx_1 + 5x_2 = 3$$

$$12x_1 + 5sx_2 = 2$$

Exercise 4. Find the area of a parallelogram whose vertices are listed: $(0,-2)$, $(5,-3)$, $(-3,1)$, $(2,0)$.

Exercise 5. Find the area of a triangle whose vertices are $(0,0)$, (v_1, v_2) , (w_1, w_2)

Exercise 6. If A is a 3×4 matrix, what is the smallest possible dimension of $\text{nul } A$?

Exercise 7. Let $A = \begin{bmatrix} 3 & 1 \\ 4 & 2 \end{bmatrix}$. Write $5A$. Is $\det(5A) = 5\det(A)$? Let A be a $n \times n$ matrix and let k be a scalar. Find a formula for $\det(kA)$ in terms of k and $\det(A)$.