1.(1 pt)
Find the determinant of the matrix

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

det$A$ = ____

2.(1 pt)
Find the determinant of the matrix

$$B = \begin{bmatrix} 2 & -3 & 1 \\ 4 & 4 & 5 \\ -3 & 4 & -5 \end{bmatrix}$$

det$B$ = ____

3.(1 pt)
Find the determinant of the matrix

$$C = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & -3 & -3 & 0 \\ 1 & 1 & -1 & -2 \\ 2 & 1 & -2 & 1 \end{bmatrix}$$

det$C$ = ____

4.(1 pt) You'll need to use formatted text mode in order to do this problem: click the "formatted text" radio button at the bottom of the page and then click "submit answer".
If

$$A = \begin{pmatrix} -2 & -2 \\ 3 & 2 \end{pmatrix}$$

Then

$$\det(A) = \_\_ \quad \text{and} \quad A^{-1} = \begin{pmatrix} \_\_ & \_\_ \\ \_\_ & \_\_ \end{pmatrix}$$

5.(1 pt) You'll need to use formatted text mode in order to do this problem: click the "formatted text" radio button at the bottom of the page and then click "submit answer".
If

$$A = \begin{pmatrix} 0 & 2 \\ 1 & -4 \end{pmatrix}$$

Then

$$\det(A) = \_\_ \quad \text{and} \quad A^{-1} = \begin{pmatrix} \_\_ & \_\_ \\ \_\_ & \_\_ \end{pmatrix}$$

6.(1 pt)
Find the area of the parallelogram with vertices at $(5,-3)$, $(16,-12)$, $(11,8)$, and $(22,-1)$.
Area = ____

7.(1 pt) Find the volume of the parallelepiped with one vertex at $(0,2,-1)$, and adjacent vertices at $(-6,-5,-1)$, $(7,8,6)$, and $(7,5,-3)$.
Area = ____

8.(1 pt)
Find k such that the matrix

$$M = \begin{bmatrix} -3 & 5 & -1 \\ -6 & 6 & -6 \\ 1+k & -1 & 5 \end{bmatrix}$$

is singular.
k = ____

9.(1 pt)
If A and B are 4×4 matrices, det $(A) = 2$, and det $(B) = 4$, then
det (AB) = ____
det $(-2A)$ = ____
det (B^{-1}) = ____
det (B^3) = ____

10.(1 pt)
Consider the following general matrix equation:

$$\begin{pmatrix} a_1 \\ a_2 \end{pmatrix} = \begin{pmatrix} m_{11} & m_{12} \\ m_{21} & m_{22} \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \end{pmatrix}$$

which can also be abbreviated as:

$$A = MX$$

By definition, the determinant of M is given by

$$\det(M) = m_{11}m_{22} - m_{12}m_{21}$$

The following questions are about the relationship between the determinant of M and the ability to solve the equation above for A in terms of X or for X in terms of A.
Check the boxes which make the statement correct:
If the $\det(M) \neq 0$ **then**

- A. given any A there is one and only one X which will satisfy the equation.
- B. some values of X will have more than one value of A which satisfy the equation.
- C. given any X there is one and only one A which will satisfy the equation.
- D. some values of A will have no values of X which will satisfy the equation.
- E. some values of X will have no values of A which satisfy the equation.
- F. some values of A (such as $A = 0$) will allow more than one X to satisfy the equation.

Check the boxes which make the statement correct:
If the $\det(M) = 0$ **then**

- A. there is no value of X which satisfies the equation when $A = 0$.
- B. some values of A (such as $A = 0$) will allow more than one X to satisfy the equation.
- C. given any A the is one and only one X which will satisfy the equation.

- D. given any X there is one and only one A which will satisfy the equation.
- E. some values of A will have no values of X which will satisfy the equation.

Check the conditions that guarantee that $\det(M) = 0$**:**

- A. Given any A the is one and only one X which will satisfy the equation.
- B. There is some value of A for which no value of X satisfies the equation.
- C. When $A = 0$ there is more than one X which satisfies the equation.
- D. Given any X there is one and only one A which will satisfy the equation.