1. (1 point)
Calculate the 3x3 determinant:
$\begin{vmatrix} 4 & 4 & 0 \\ -4 & -5 & 7 \\ -3 & 5 & 6 \end{vmatrix} =$ _____

2. (1 point) Evaluate the following 3×3 determinant.

$$\begin{vmatrix} 9 & 0 & -8 \\ -1 & 0 & -3 \\ -7 & 0 & 2 \end{vmatrix}$$

Answer: _____

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

$$M = \begin{bmatrix} 1 & 0 & -1 \\ 0 & 6 & 2 \\ 0 & 0 & -3 \end{bmatrix}.$$

$\det(M) =$ _____.

4. (1 point) Compute the determinant of the following 3 X 3 matrix:

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

The determinant is _____

5. (1 point) Evaluate the following 4×4 determinant.

$$\begin{vmatrix} 4 & 10 & -1 & -1 \\ 5 & 2 & 6 & 1 \\ 0 & 0 & 1 & 0 \\ 12 & 2 & 5 & -10 \end{vmatrix}$$

Answer: _____

6. (1 point)
The determinant of the matrix

$$A = \begin{bmatrix} 0 & 7 & -3 & 0 & 0 \\ -5 & 9 & -6 & 0 & 0 \\ 0 & -8 & 0 & 0 & 0 \\ -7 & -5 & 2 & 4 & -1 \\ -1 & 8 & 1 & 0 & -3 \end{bmatrix}$$

is _____.
Hint: Find a good row or column for cofactor expansion.

7. (1 point)
If A and B are 3×3 matrices, $\det(A) = 4$, $\det(B) = -9$, then
$\det(AB) =$ _____,
$\det(-2A) =$ _____,
$\det(A^T) =$ _____,
$\det(B^{-1}) =$ _____,
$\det(B^2) =$ _____.

8. (1 point)
If $B = \begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & -1 \\ 2 & 1 & -1 \end{bmatrix}$
then $\det(B^5) =$ _____

9. (1 point)
If the determinant of a 4×4 matrix A is $\det(A) = 5$, and the matrix C is obtained from A by swapping the third and fourth rows, then

$\det(C) =$ _____.

10. (1 point)
If the determinant of a 5×5 matrix A is $\det(A) = 6$, and the matrix D is obtained from A by adding 3 times the third row to the second, then

$\det(D) =$ _____.

11. (1 point) Given the matrix

$$\begin{bmatrix} -3 & -1 & 4 \\ 5 & 0 & 3 \\ 0 & 4 & 3 \end{bmatrix}$$

(a) find its determinant;
Your answer is : _____
(b) does the matrix have an inverse?
Your answer is (input Yes or No) : _____

12. (1 point)
If $A = \begin{bmatrix} -5 & 2 & -1 \\ -4 & 1 & 3 \\ 3 & 2 & -3 \end{bmatrix}$, then $\det(A) =$ _____

Is A invertible?

- A. Yes
- B. No