1. (1 point)
Calculate the 3x3 determinant:
$$\begin{vmatrix} 4 & 4 & 0 \\ -4 & -5 & 7 \\ -3 & 5 & 6 \end{vmatrix} = \underline{\hspace{2cm}}$$

Solution:
Solution:
Using the definition of 3x3 determinant we get:
$$\begin{vmatrix} 4 & 4 & 0 \\ -4 & -5 & 7 \\ -3 & 5 & 6 \end{vmatrix} = 4\begin{vmatrix} -5 & 7 \\ 5 & 6 \end{vmatrix} - 4\begin{vmatrix} -4 & 7 \\ -3 & 6 \end{vmatrix} +$$
$$0\begin{vmatrix} -4 & -5 \\ -3 & 5 \end{vmatrix} =$$
$$= 4(-5 \cdot 6 - 7 \cdot 5) - 4(-4 \cdot 6 - 7 \cdot -3) + 0(-4 \cdot 5 + 5 \cdot -3) =$$
$$-248$$

Correct Answers:

- -248

2. (1 point) Evaluate the following 3×3 determinant.
$$\begin{vmatrix} 9 & 0 & -8 \\ -1 & 0 & -3 \\ -7 & 0 & 2 \end{vmatrix}$$

Answer: _____
Correct Answers:

- 0

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) = $ _____.
Correct Answers:

- 1*6*-3

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 _____
Correct Answers:

- 15

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: _____
Correct Answers:

- 546

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.
Correct Answers:

- 1440

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) = $ ____.
Correct Answers:

- -36
- -32
- 4
- -0.111111111111111
- 81

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

- -1

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

$\det(C) =$ _____.

Correct Answers:

- -5

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

$\det(D) =$ _____.

Correct Answers:

- 6

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) : _____

Correct Answers:

- 131
- YES

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

Correct Answers:

- 50
- A