# COFACTOR FORMULA

In the field of mathematics, a cofactor is what we call a scalar entity (which has no direction) that is related to a given element in a matrix. For any given matrix A, the cofactor at let's say a row 'i' and column 'j' is represented as Cij and is computed by taking the determinant of the submatrix created by deleting the i-th row and the j-th column and then multiplying it by $(-1)^{ij}$.

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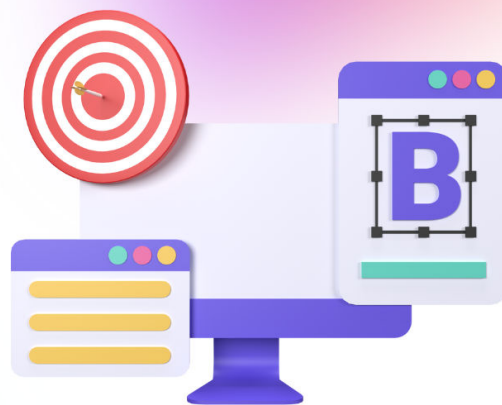
Q1: How is a cofactor different from a determinant?

A: A cofactor is always a positive number.
B: A cofactor is a single value, while a determinant is a matrix.
C: A cofactor is used in matrix operations, while a determinant is not.
D: A cofactor is the same as a determinant.

Q2: What is the formula for calculating the cofactor of an element (a_ij) in a matrix?

A: Cofactor(a_ij) = a_ij
B: Cofactor(a_ij) = (-1)^(i+j) * Minor(a_ij)
C: Cofactor(a_ij) = Minor(a_ij) / Determinant
D: Cofactor(a_ij) = a_ij / (i + j)

Q3: What is the cofactor of an element located in the first row and second column of a matrix?

A: A cofactor is always 1.
B: A cofactor is always -1.
C: It depends on the matrix size.
D: A cofactor is determined by the element's value.

Q4: Which operation does the cofactor formula not employ:

A: Finding the determinants
B: Finding the inverse of matrices
C: Using Cranmer's Rule
D: Using distribution

Q5: Cranmer's Rule is used to:

A: Solve systems of linear equations
B: Solve systems of any kind of equations
C: Solve linear equations
D: None of the above

Q6: Cofactor expansion is also known as:

A: Commonplace expansion
B: Factor expansion
C: Laplace expansion
D: Determinant expansion

Q7: What best describes cofactor expansion:

A: The process used for computing the cofactor of a square matrix by dividing it into smaller submatrices.
B: The process used for computing the determinant of a square matrix by dividing it into smaller submatrices.
C: The process used for computing the inverse of a square matrix by dividing it into smaller submatrices.
D: None of the above

Q8: What are minors?

A: Minors are the determinants of a submatrix of a bigger matrix
B: Minors are the inverse of a submatrix of a bigger matrix
C: Minors are the cofactors of a submatrix of a bigger matrix
D: All of the above

Q9: How does a cofactor differ from a minor?

A: Cofactors are vector quantities that are related to a particular element in a matrix whereas minors are the determinants of a submatrix of a bigger matrix.
B: Cofactors are scalar quantities that are related to a particular element in a matrix whereas minors are the inverse of a submatrix of a bigger matrix.
C: Cofactors are scalar quantities that are related to a particular element in a matrix whereas minors are the determinants of a submatrix of a bigger matrix.
D: Cofactors are scalar quantities that are not related to a particular element in a matrix whereas minors are the determinants of a submatrix of a bigger matrix.

Q10: What role do cofactors play in matrix algebra?

A: Cofactors help in computing the inverse of a matrix by adding up the products of the entities of any row or column with their related cofactors
B: Cofactors help in computing the determinants of a submatrix by adding up the products of the entities of any row or column with their related cofactors
C: Cofactors help in computing the determinants of a matrix by adding up the products of the entities of any row or column with their related cofactors
D: Cofactors add up the products of the entities of any row or column with their related determinants.

Answers

Q1: B - A cofactor is a single value, while a determinant is a matrix.

Q2: B - Cofactor(a_ij) = (-1)^(i+j) * Minor(a_ij)

Q3: B - A cofactor is always -1.

Q4: D - Using distribution

Q5: A - Solve systems of linear equations

Q6: C - Laplace expansion

Q7: B - The process used for computing the determinant of a square matrix by dividing it into smaller submatrices.

Q8: A - Minors are the determinants of a submatrix of a bigger matrix

Q9: C - Cofactors are scalar quantities that are related to a particular element in a matrix whereas minors are the determinants of a submatrix of a bigger matrix.

Q10: C - Cofactors help in computing the determinants of a matrix by adding up the products of the entities of any row or column with their related cofactors