Finding the Determinant by Cofactor Expansion

- Step 1: Choose any row or column in a given matrix, preferably the one that contains most zeros
- **Step 2:** Along that row or column, multiply each entry by the corresponding cofactor $(-1)^{i+j} \det(A_{ij})$ where A_{ij} is a matrix obtained by deleting row i and column j from matrix A and then add the results.

Note: To find a determinant for a 2 x 2 matrix, you multiply entries on the main diagonal and subtract the product of entries on the opposite diagonal.

Example: To find the determinant of237-406using cofactor expansion wewill choose last row.150

$$\begin{vmatrix} 2 & 3 & 7 \\ -4 & 0 & 6 \\ 1 & 5 & 0 \end{vmatrix} = 1(-1)^{3+1} \begin{vmatrix} 3 & 7 \\ 0 & 6 \end{vmatrix} + 5(-1)^{3+2} \begin{vmatrix} 2 & 7 \\ -4 & 6 \end{vmatrix} + 0(-1)^{3+3} \begin{vmatrix} 2 & 3 \\ -4 & 0 \end{vmatrix}$$
$$= 1(1) [3(6) - 0(7)] + 5(-1)[2(6) - (-4)(7)] + 0$$
$$= -182$$

Ouestion 1: Fill in the missing solution.

 $\begin{vmatrix} 3 & 1 & -5 \\ -1 & 3 & 0 \\ 7 & -4 & 2 \end{vmatrix} = ()(-1)^{[]} \begin{vmatrix} +()(-1)^{[]} \end{vmatrix} + ()(-1)^{[]} \end{vmatrix}$ Answer:

Question 2: Fill in the missing solution.

$$\begin{vmatrix} 2 & 6 & 4 \\ -3 & 1 & 5 \\ 7 & -1 & 2 \end{vmatrix} = ()(-1)^{[]} + ()(-1)^{[]} + ()(-1)^{[]} + ()(-1)^{[]} \end{vmatrix}$$

Answer:

Question 3: Find the determinants of the following.

a)	- 3 2	7 5	0 5]
	- 1	1	0	

Answer:



Answer:

	-		_
	2	3	1
C)	-8	0	30
	4	0	0

Answer:

Answers:

- Q1) 105
- Q2) 244
- Q3) a. 20
- Q3) b. 39
- Q3) c. 360

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