matrix minor and matrix cofactor
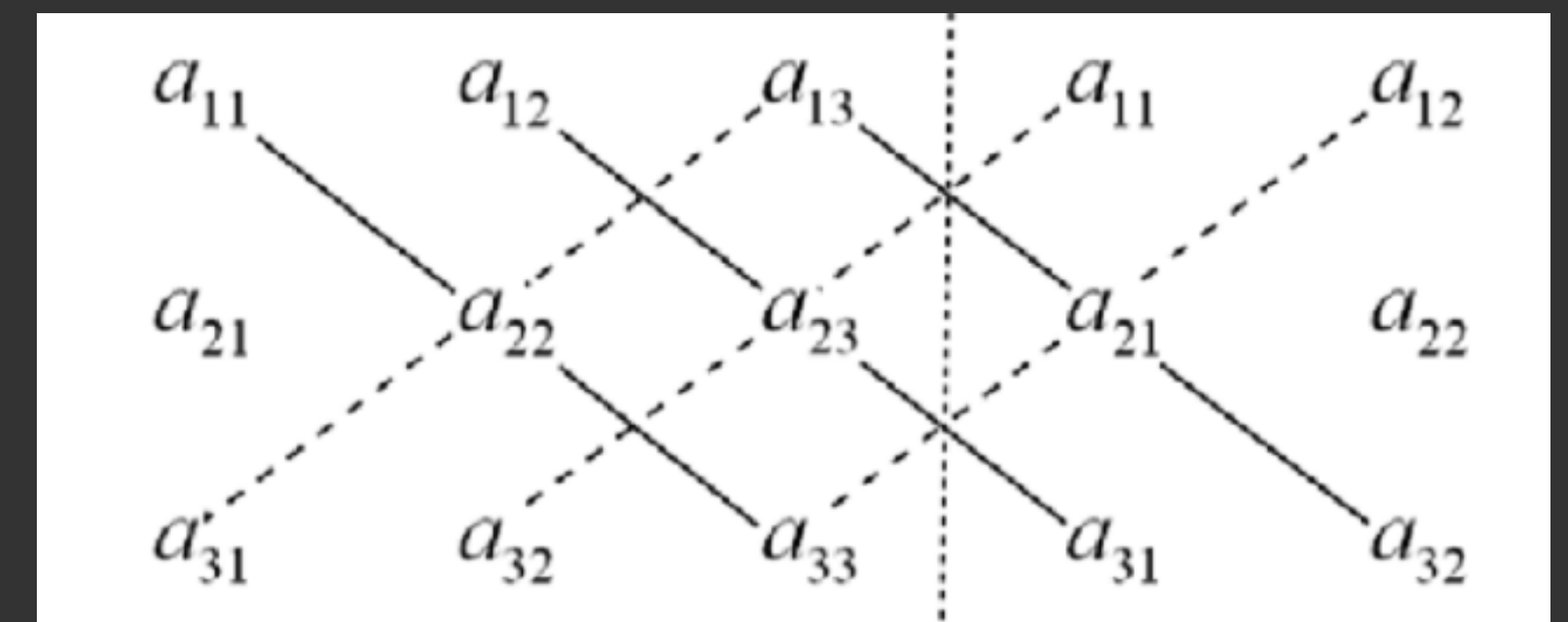
exercise 3

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

(a)   Find the cofactor expansions along the first column.

(b)   Find the determinant of A.

Note: using your tutorial you will cover another way to find the determinant called the butterfly method
(only works for 3×3 matrices)

properties of the determinant

Let A and B be $n \times n$ matrices and let k be a scalar

- $det(kA) = k^n \cdot det(A)$

- $det(A^T) = det(A)$

- $det(AB) = det(A)det(B)$

- If A is invertible then

$$det(A^{-1}) = \frac{1}{det(A)}$$

- A matrix A is invertible if and only if $det(A) \neq 0$

- A square matrix that has $det(A) = 0$ is called singular and is not invertible