COFACTORS OF IDENTITY MATRICES

$$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

$(n \times n)$ case

$I(k,k) = 1$ since

$k+k$ even, matrix =
identity with size $n-1$.

$$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

$i \neq j$, say $(i,j) = (1,3)$

Notice ~~second~~
2nd row of new matrix = 0
1st column of new matrix = 0
So the cofactor will be
zero.

More generally, for $(i,j) = (1,j)$ with
$j > 1$, in the new matrix the 1st column
is zero and likewise for row $(j-1)$ in the
new matrix.

Hence if we look at the minors formula
for the identity matrix, the net result is 1,
which is what we want it to be.