

SECTION 4.2
EXERCISE #13

4.2.13

Find the cofactor of 7 in

$$A = \begin{bmatrix} 2 & 0 & -1 & 7 \\ 6 & 1 & 0 & 4 \\ 8 & -2 & 1 & 0 \\ 4 & 1 & 0 & 2 \end{bmatrix}.$$

Solution

Well the 7 is entry a_{14} so we need to find the minor matrix A_{14} and the cofactor $a'_{14} = (-1)^{1+4} \det(A_{14})$. So

$$A_{14} = \begin{bmatrix} 6 & 1 & 0 \\ 8 & -2 & 1 \\ 4 & 1 & 0 \end{bmatrix}, \text{ and we find } \det(A_{14})$$

by expanding along the 3rd column:

$$\begin{aligned} \det(A_{14}) &= +(0) - (1) \begin{vmatrix} 6 & 1 \\ 4 & 1 \end{vmatrix} + (0) \\ &= -((6)(1) - (1)(4)) = -2. \end{aligned}$$

Hence

$$a'_{14} = (-1)^5 \det(A_{14}) = -(-2) = 2$$

□