

Name: Solution

1. Find  $M_{21}$  and  $C_{21}$  for the matrix  $A$ . That is, find the minor of  $a_{21}$  and the cofactor of  $a_{21}$ .

$$A = \begin{bmatrix} 4 & -1 & 1 & 6 \\ 0 & 0 & -3 & 3 \\ 4 & 1 & 0 & 14 \\ 4 & 1 & 3 & 2 \end{bmatrix}$$

$$M_{21} = \begin{vmatrix} -1 & 1 & 6 \\ 1 & 0 & 14 \\ 1 & 3 & 2 \end{vmatrix}$$

$$= - \begin{vmatrix} 1 & 14 \\ 1 & 2 \end{vmatrix} + 0 \begin{vmatrix} -1 & 6 \\ 1 & 2 \end{vmatrix} - 3 \begin{vmatrix} -1 & 6 \\ 1 & 14 \end{vmatrix}$$

$$= - (2 - 14) + 0 - 3(-14 - 6)$$

$$= 12 + 60$$

$$= \underline{72}.$$

$$C_{21} = (-1)^{2+1} M_{21}$$

$$= \underline{-72}.$$