

2)

$$\text{If } A = \begin{bmatrix} 2 & 1 \\ -3 & 4 \end{bmatrix}, \text{ then } \det A = 5 \text{ and } \det 3A = \begin{bmatrix} 6 & 3 \\ -9 & 12 \end{bmatrix} = 3^2$$

$$\det A = (9)(5) \\ = 45$$

$$\text{Ex. 3) Let } \det A = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} = 3,$$

$$\text{Then } \begin{vmatrix} 3a_1 & b_1 - b_1 & c_1 + a_1 \\ 3a_2 & b_2 - c_2 & c_2 + a_2 \\ 3a_3 & b_3 - c_3 & c_3 + a_3 \end{vmatrix} = 3 \begin{vmatrix} a_1 & b_1 - c_1 & c_1 + a_1 \\ a_2 & b_2 - c_2 & c_2 + a_2 \\ a_3 & b_3 - c_3 & c_3 + a_3 \end{vmatrix} \quad C_3' = c_3 - c_1$$

$$= 3 \begin{vmatrix} a_1 & b_1 - c_1 & a_1 \\ a_2 & b_2 - c_2 & c_2 \\ a_3 & b_3 - c_3 & c_3 \end{vmatrix} \quad C_2' = c_2 + c_3$$

$$= 3 \begin{vmatrix} a_1 & b_1 & a_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} = 9$$

Ex. 4) Find values of  $k$  such that  $A$  is not invertible

$$\text{where } A = \begin{bmatrix} 6 & k & 0 \\ 0 & 2 & -1 \\ k & 0 & 3 \end{bmatrix}$$

For me;

review problem

$A$  is not invertible if  $\det A = 0$

$$\det A = \begin{vmatrix} 6 & k & 0 \\ 0 & 2 & -1 \\ k & 0 & 3 \end{vmatrix} = 6 \begin{vmatrix} 2 & -1 \\ 0 & 3 \end{vmatrix} - k \begin{vmatrix} 0 & -1 \\ k & 3 \end{vmatrix} + 0 = 0 = 6(6-0) - k(k+0) \\ = 36 - k^2$$

$$k = \pm 6$$