

~~1.~~ Let

$$A = \begin{bmatrix} 1 & 2 & 4 \\ 0 & -2 & 9 \\ 1 & 0 & -5 \end{bmatrix}$$

Determine

$$\text{tr}(A), \quad \text{adj}(A), \quad \det(A)$$

~~2.~~ A system of 3 equations in 3 unknowns $\{x_1, x_2, x_3\}$ has the following augmented matrix

$$G = \begin{bmatrix} 1 & c & 1 & a \\ 2 & 1 & 1 & 1 \\ 0 & 1 & -1 & c \end{bmatrix}$$

where a, c are given real numbers.

- Find the reduced row-echelon form of G .
- How many solutions does the system have? \

~~3.~~ Let

$$A = \begin{bmatrix} a & x & r \\ b & y & s \\ c & z & t \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} a & c & b \\ x & z & y \\ r & t & s \end{bmatrix}$$

Assuming that $\det(A) = -7$, find $\det(B)$.

~~4.~~ Let

$$L = \begin{bmatrix} k+1 & k-1 & 7 \\ 2 & k-3 & 4 \\ 5 & k+1 & 4 \end{bmatrix}$$

where k is a given real number.

- Calculate the following cofactors of L : C_{11} , C_{12} , and C_{13}
- Find the value of k for which the matrix L is singular.

5. Show that if $\det(A) = 1$ then $\text{adj}(A^{-1}) = A$

~~6.~~ Find the *eigenvalues* and the corresponding *eigenvectors* of the matrix

$$E = \begin{bmatrix} 3 & 1 \\ -5 & -3 \end{bmatrix}$$