Mathematics 1 - 1. test (LA)

var. 1

full name: .....

1. How many solutions does the system have:
$$\begin{aligned} x+y+z &= 1 \\ 3x+2y+z &= 0 \\ x+2y+3z &= 1 \end{aligned}$$
.....

2. What is a dimension of the vector space generate by:
$\vec{u}=(1,3,1), \vec{v}=(1,2,2), \vec{w}=(1,1,3)$?
.....

3. Verify if an inverse matrix A^{-1} exists.
If so, compute its determinant ($\det(A^{-1})$):
$$A=\begin{pmatrix} 1 & -2 & 3 \\ -1 & -1 & -3 \\ 3 & -3 & 1 \end{pmatrix}$$
.....

4. Compute the matrix $A \cdot B$
$$A=\begin{pmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \end{pmatrix} B=\begin{pmatrix} 1 & 0 \\ 1 & 1 \\ 0 & 2 \end{pmatrix}$$
.....

5. For which $p=?$ are the vectors Linearly Independent?
$\vec{u}=(-1,0,1), \vec{v}=(0,1,p), \vec{w}=(2,0,p)$
.....

6. For which $a=?$ the system hasn't got a solution?
$$\begin{aligned} ax-3y &= 1 \\ ax-2y &= 2 \end{aligned}$$
.....

7. Compute z:
$$\begin{aligned} 2x-3y+z &= 0 \\ x+2y-z &= 3 \\ 2x+y+z &= 12 \end{aligned}$$
.....

8. Find all solutions of the system:
$$\begin{aligned} 9x-3y &= 9 \\ -6x+2y &= -6 \end{aligned}$$
.....

9. Compute the determinant:
$$\begin{vmatrix} 1 & 2 & 0 & -1 \\ 0 & -1 & -1 & 1 \\ 0 & 2 & 0 & 0 \\ -1 & 1 & -1 & 0 \end{vmatrix}$$
.....

10. Find all eigenvalues of the matrix:
$$\begin{pmatrix} 1 & 1 \\ 2 & 3 \end{pmatrix}$$
.....