Linear Algebra. Test 2. Variant 1.

First name	Last name	Group	Points#1
		BS1-	

I am, _____ (initials), confirming that I have read the following rules and agree to comply with them, that all solutions on this paper is my own work.

_____ (signature)

Rules:

- no talking AT ALL is allowed during the exam and after it (if you are still in the room)
- you can use 1 sheet of A4 paper with formulas on both sides
- any electronic devices are not allowed except for a simple non-programmable calculator
- when time is up, you have to put down your pen (pencil) and do NOT write anything else
- you can NOT leave your seat till the end of the test

1. Find $det(e^A)$ for the matrix (5 points):

$$A = \begin{bmatrix} -1 & 2 & 0 \\ 1 & 0 & 0 \\ 0 & 1 & 0 \end{bmatrix}.$$

2. Write down the first order equation system for the following differential equation and solve it (4 points):

$$\begin{cases} y''' + y'' - 2y' = 0 \\ y''(0) = 2, \quad y'(0) = 0, \quad y(0) = 1 \end{cases}$$

   Is the solution of this system will be stable? (1 points)

3. Find the SVD (4 points) and the pseudoinverse (1 points) of the matrix:

$$A = \begin{bmatrix} 2 & 1 \\ -2 & 2 \\ 1 & 2 \end{bmatrix}$$