## Linear Algebra. Test 1. Variant 1.

First name	Last name	Group	Points#1
		BS1-	

I am.	(initials)	confirming	that I have rea	d the following	o rules and a	gree to compl	v with them	, that all solutions of	nn this naner is my	own work
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## Rules:

- no talking AT ALL is allowed during the exam and after it (if you are still in the room)
- 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
- any electronic devices are not allowed
- **1.** Find linear independent vectors (exclude dependent). (4 points) Find  $\operatorname{rank}(A)$  if A is a composition of this vectors. Find  $\operatorname{rank}(A^T)$ . (1 point)

$$\vec{a} = \begin{pmatrix} 4 \\ 0 \\ 3 \\ 2 \end{pmatrix} \ \vec{b} = \begin{pmatrix} 1 \\ -7 \\ 4 \\ 5 \end{pmatrix} \ \vec{c} = \begin{pmatrix} 7 \\ 1 \\ 5 \\ 3 \end{pmatrix} \ \vec{d} = \begin{pmatrix} -5 \\ -3 \\ -3 \\ -1 \end{pmatrix} \ \vec{e} = \begin{pmatrix} 1 \\ -5 \\ 2 \\ 3 \end{pmatrix}$$

## Linear Algebra. Test 1. Variant 1.

First name	Last name	Group	Points#2
		BS1-	

lam,	(initials), confirmi	ng that I have read the	following rules and a	gree to comply v	with them, that all solutions	on this paper is my own work.

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2. Find E: EA = U (U – upper-triangular matrix). (3 points) Find  $L = E^{-1}$ .(2 points)

$$A = \begin{bmatrix} 2 & 5 & 7 \\ 6 & 4 & 9 \\ 4 & 1 & 8 \end{bmatrix}$$

## Linear Algebra. Test 1. Variant 1.

First name	Last name	Group	Points#3
		BS1-	

I am,	(initials), confirming t	that I have read the following	rules and agi	ree to comply	with them, that all sol	utions on this paper is my own work.

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**3.** Find complete solution for the system Ax=b:(4 points)
Provide an example of vector b that makes this system unsolvable. (1 point)

$$\begin{cases} 6x_1 - 2x_2 + x_3 - 4x_4 = 7 \\ 4x_1 + 2x_2 + 14x_3 - 31x_4 = 18 \\ 2x_1 - x_2 + 3x_3 - 7x_4 = 5 \end{cases}$$