

# Linear algebra, WNE, 2018/2019 meeting 3.

9 October 2018

## Problems

1. Find the general solutions to the following systems of equations.

$$\begin{cases} 3a + 2b + 3c + 4d = 8 \\ a + b + c + 2d = 4 \\ 5a + 3b + 6c + 3d = 9 \end{cases}$$

$$\begin{cases} 3a + 2b + c + 4d + 3e = 1 \\ 5a + 8b + 2c + 5d + 8e = 4 \\ 4a - 2b + c + 7d + e = 2 \end{cases}$$

$$\begin{cases} 5x + 2y + 8z = 1 \\ 6x - 3y - 4z = 4 \\ 7x + 4y + 9z = 6 \\ 4x - 5y - 4z = -2 \end{cases}$$

2. Zenobi bought a doughnut, 2 bottles of water and a sandwich, and paid 4.5PLN, and Zdzisław, who bought 2 doughnuts, 5 bottles of water and 3 sandwiches, spent 11PLN. Is it possible to calculate how much money Zbigniew spent, if he bought 2 doughnuts, 6 bottles of water and 4 sandwiches?

## Homework

### Group 8:00

1. For which real numbers  $s \in \mathbb{R}$  the following system of equations is inconsistent?

$$\begin{cases} 2x_1 + 2x_2 - 4x_3 = 6 \\ -x_1 + 3x_2 + 2x_3 = 1 \\ -2sx_1 + sx_2 + 4x_3 = -3 \end{cases}$$

### Group 9:45

1. For which real numbers  $s \in \mathbb{R}$  the following system of equations is inconsistent?

$$\begin{cases} -4x_1 + 2x_2 + 2x_3 = 6 \\ -2x_1 - 3x_2 + x_3 = -1 \\ -4x_1 - 2sx_2 + 4sx_3 = -4 \end{cases}$$

## Things you should recall before our next meeting

1. Definition of a vector space and subspace.
2. Definition of linear combination, linear span, and linear independence.
3. Basis and dimension of a vector space.