Linear algebra, WNE, 2018/2019
meeting 7.

23 October 2018

Problems

1. Find a basis and dimension of a space spanned by vectors $(3,2,1,1),(5,0,2,3),(4,1,4,5),(4,1,-1,-1)$.
2. Find a system of equation which describes the above space.
3. Find a basis and dimension of the space of solutions to the following system of equations.

$$\begin{cases} 5a+10b+6c+3d=0 \\ 2a+4b+4c+3d=0 \\ 3a+6b+5c+5d=0 \end{cases}$$

4. Find the coordinates of $(5,0,0)$ with respect to the basis $(1,2,-1),(1,0,2),(0,1,1)$.
5. Let W be a space described by the following system of equations:

$$\begin{cases} x_1+x_2+2x_3-x_4+x_5=0 \\ 2x_1+3x_2-x_3+2x_4-x_5=0 \end{cases}$$

   Find a basis of W. Complete the basis to a basis of $\mathbb{R}^5$.
6. Find an example of a basis of $\mathbb{R}^3$ such that the coordinates of vector $(1,2,3)$ with respect to this basis are $3,1,2$.

Homework

Group 8:00

1. Find a basis and dimension of a space described by the following system of equations.

$$\begin{cases} 2x+12y+9z=0 \\ 8x+12y+10z=0 \\ x-3y-2z=0 \end{cases}$$

2. Complete system of vectors $(0,1,1,2,0),(1,0,0,1,0),(1,0,1,1,0)$ to a basis of $\mathbb{R}^5$ using only vectors from the space W from Problem 5.
3. Find a system of linear equations describing the space $\operatorname{lin}((-9,3,6,-3),(-4,2,1,5),(-5,5,4,3))$.

Group 9:45

1. Find a basis and dimension of a space described by the following system of equations.

$$\begin{cases} 9x+12y+2z=0 \\ 5x+6y+4z=0 \\ 2x+3y-z=0 \end{cases}$$

2. Complete the system of vectors $(1,0,0,1,0),(0,1,0,2,1),(1,0,0,1,1)$ to a basis of $\mathbb{R}^5$ using only vectors from W from Problem 5.
3. Find a system of linear equations which describes the space $\operatorname{lin}((3,1,2,-1),(4,2,1,5),(5,5,4,3))$.