

Linear algebra, WNE, 2017/2018 meeting 21.

14 December 2017

Problems

- Find a system of linear equations describing:
 - an affine subspace with direction $\text{lin}((1, 3, 0, 1), (2, 9, 4, 2)) \subseteq \mathbb{R}^4$ going through $(1, 1, -1, 2)$,
 - hyperplane $(1, 4, -3, 2) + \text{lin}((1, 2, 0, -3), (1, 4, -2, -3), (0, 3, -1, -2))$.
- Find a system of equations describing
 - plane $M \subseteq \mathbb{R}^3$ going through $(6, 1, -3), (1, 5, 1), (1, 8, 2)$,
 - line $L \subseteq \mathbb{R}^3$ going through $(1, 2, -1), (3, 4, 2)$.
- Find a parametrization of
 - line $L \subseteq \mathbb{R}^3$ going through $(1, 1, 5), (3, 2, 4)$,
 - plane $P \subseteq \mathbb{R}^3$ described by equation $2x_1 + 5x_2 - x_3 = 7$,
 - hyperplane $H \subseteq \mathbb{R}^4$ described by equation $x + y - 3z + 2t = 5$.
- Find a system of equations and a parametrization of
 - line $L \subseteq \mathbb{R}^3$ going through $(2, 1, 1)$ and perpendicular to the plane described by equation $3x - y + 2z = 6$,
 - plane $M \subseteq \mathbb{R}^3$ going through $(3, 0, 5)$ and perpendicular to the line $(1, 1, 1) + \text{lin}((2, -1, 1))$.

Homework

Group 8:00

- Find a system of equations and a parametrization of a hyperplane in \mathbb{R}^4 going through $(1, 0, 1, 1), (2, 5, 3, 0), (2, 2, 1, 1), (0, 1, 2, 3)$.
- Find a parametrization of the plane in \mathbb{R}^4 which goes through $(3, 1, 2, 1)$ and is parallel to

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

Group 9:45

- Find a system of equation and a parametrization of a hyperplane in \mathbb{R}^4 going through $(-1, 0, -1, -1), (-2, -5, -3, 0), (-2, -2, -1, -1), (0, -1, -2, -3)$.
- Find a parametrization of a plane in \mathbb{R}^4 going through $(0, 1, 0, 1)$ and parallel to

$$H : \begin{cases} x_1 + x_2 - 2x_3 + x_4 = -1 \\ 2x_1 + 3x_2 - 2x_3 + x_4 = 5 \end{cases}$$