

HOMEWORK 1

DUE WEDNESDAY, JANUARY 14

FROM JACOB:

Section 1.3 — #1 a-f, #4 a,d

Matrix Powers Group Project

Section 2.3 — #1 a, #5 a, #7 b

NOT FROM JACOB:

1. Take two points $p, q \in \mathbb{R}^3$ and let $L \subset \mathbb{R}^3$ be the line containing them. If p and q are both solutions to the same system of linear equations, must every point on L also be a solution to that same system? Explain why or why not.

2. Find a parametric description for the solution set of the following system of linear equations and determine its geometric type (point, line, plane, etc.).

$$1 = 3x + 2y + z$$

$$2 = x + y + z$$

$$4 = 7x + 5y + 3z$$

3. Determine the minimal number of parameters needed for a parametric representation of the following set, find a parameterization for the set that uses that many parameters, and indicate which kind of geometric object the set represents.

$$\left\{ \begin{pmatrix} u - 2t - v \\ 3u + 6t - 3v \\ -u - 2t + v \end{pmatrix} \mid u, t, v \in \mathbb{R} \right\}$$