

ICMA 223 Linear Algebra A

Problem Set 1

GENERAL INFORMATION

Important Note! Please do write a list of collaborators (friends you work with) and sources you consult for this assignment (e.g. lecture notes, specific pages of a book, specific links to Wikipedia, etc., but do not write just “YouTube” or “Google” without further information). Even if you work on this assignment alone and do not consult any source, please write “**Collaborators:** None. **Sources consulted:** None.” in your submission.

Collaboration on problem sets is allowed, and is in fact encouraged. Working with friends can be an enjoyable way to learn mathematics!

Information: This problem set is ungraded. You should work on all the problems, but you do not need to submit your work.

For each problem, please show your work! For correct answers alone without proper explanations or derivations, you might be awarded only very few, or even zero, points. On the other hand, for incorrect answers with proper explanations or derivations, you might be awarded a lot of points.

PROBLEM 0

Please provide the following information. Please refer to the “General Information” section above for details.

- (a) What is your full name (first name and last name)?
- (b) What is your student ID number?
- (c) Which section are you a student of, Section 1 or Section 2?
- (d) Please write the list of your collaborators for this problem set.
- (e) Please write the list of sources you consult for this problem set.

Optional: what is your nickname (if you have one)?

PROBLEM 1

Consider the system

$$\begin{cases} x + y - z = 0, \\ 2y + 3z = 4, \\ -x + z = -1, \end{cases}$$

of three linear equations in the variables x, y, z .

Determine the set of all real numbers t such that the triple $(1 + t, 1 - t, t)$ is a solution to the linear system.

PROBLEM 2

Consider the system

$$\begin{cases} x + 2y - z = 5, \\ 2x - y + 3z = -1, \end{cases}$$

of two linear equations in the variables x, y, z .

Determine the set of all real numbers u such that the triple $(u, u + 1, 2u)$ is a solution to the linear system.

PROBLEM 3

Consider the system

$$\begin{cases} x + y = 1, \\ -3x + z = 2, \\ -x + 2y + z = 4, \end{cases}$$

of three linear equations in the variables x, y, z .

Determine the set of all real numbers v such that the triple $(-v, 1 + v, 2 - 3v)$ is a solution to the linear system.
