

**MATH3200: APPLIED LINEAR ALGEBRA**  
**PRACTICE MODULE 21: INTRODUCTION TO LINEAR SYSTEMS**

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We will use here the notation and terminology of Lecture 11.

Consider the following systems of linear equations:

$$(1) \quad \begin{array}{rcl} 3x_1 & + & 4x_2 = 0 \\ 6x_1 & + & 8x_2 = 0 \end{array}$$

$$(2) \quad \begin{array}{rcl} 3x_1 & + & 4x_2 = 10 \\ & & x_2 = 1 \end{array}$$

$$(3) \quad \begin{array}{rcl} 3x_1 & + & 4x_2 = 1 \\ 6x_1 & + & 8x_2 = 1 \end{array}$$

$$(4) \quad \begin{array}{rcl} 3x_1 & + & 4x_2 = 0 \\ & & x_2 = x_3 \end{array}$$

**Question 21.1:** Which of the above systems can be written as a homogenous system?

**Question 21.2:** Which of the above systems are consistent?

**Question 21.3:** Which of the above systems are underdetermined?

**Question 21.4:** Which of the above systems are overdetermined?