

UNIVERSITY OF REGINA
DEPARTMENT OF MATHEMATICS AND STATISTICS
MATH 122 200610 Quiz 1 (B Version)

Time: 30 minutes

Instructor: Dr. Edward Doolittle

Name: _____

Student #: _____

(marks) Please do questions 1 and 2. You have 10 minutes to do each question, and 10 minutes to check your work, for a total of 30 minutes for the quiz. A non-programmable calculator is allowed but is not necessary. Please remain in your seat for the entire 30 minutes. If you finish early, give question 3 a try.

(10) 1. Solve the following system by using elementary row operations on the equations or on the augmented matrix. Follow the systematic elimination procedure described in the textbook.

$$\begin{aligned}x_1 - 3x_2 + 4x_3 &= -7 \\3x_1 - 7x_2 + 7x_3 &= -1 \\-4x_1 + 6x_2 - x_3 &= 2.\end{aligned}$$

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- (10) 2. Choose values for h and k in the following system

$$\begin{aligned}x_1 + 4x_2 &= 5 \\ 2x_1 + hx_2 &= k\end{aligned}$$

such that

- (a) the system has a unique solution;
 - (b) the system has no solution; and
 - (c) the system has infinitely many solutions.
- (0) 3. *Something to amuse you if you finish early.* A 3×3 magic square consists of 9 numbers x_1, \dots, x_9 that are arranged in a square with the property that the sum of any row is 0, the sum of any column is 0, and the sum of any diagonal is 0. Use linear algebra to find all 3×3 magic squares.