

# MEMORIAL UNIVERSITY OF NEWFOUNDLAND

## DEPARTMENT OF MATHEMATICS AND STATISTICS

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ASSIGNMENT 2

**MATH 2050**

DUE: THUR MAY 24

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1. Margo has 1.05 dollars in dimes nickels, and pennies. If there are 17 coins in all, how many coins of each type can she have?
2. Solve the given systems by reduction corresponding Augmented Matrix to Row-Echelon Form (REF). Find the rank of the matrix of coefficients.

(a) 
$$\begin{cases} x + y + z = 2 \\ x + z = 1 \\ 2x + 5y + 2z = 7 \end{cases}$$

(c) 
$$\begin{cases} x + y + 2z = 8 \\ x - 3y - 4z = 4 \\ 3x - y + z = 0 \end{cases}$$

(b) 
$$\begin{cases} 5x + y = 2 \\ 3x - y + 2z = 1 \\ x + y - z = 6 \end{cases}$$

3. In each of the following find conditions for  $a, b, c$  such that the system has no solutions, a unique solution, or infinitely many solutions.

(a) 
$$\begin{cases} x - y + 2z = a \\ 3x + y - z = b \\ 5x + 3y - 4z = c \end{cases}$$

(c) 
$$\begin{cases} 3x - y + 2z = 3 \\ x + y - z = 2 \\ 2x - 2y + 3z = b \end{cases}$$

(b) 
$$\begin{cases} x + ay = 0 \\ y + bz = 0 \\ z + cx = 0 \end{cases}$$

4. Find all solutions to the following system in parametric form in two ways. Use sample value of parameter to obtain a particular numeric solution from one of the forms. Then find value of parameter in another form that yield the same numeric solution.

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

5. (Partial fraction decomposition): Find  $a, b, c$  such that

$$\frac{9x^2 + 4x + 7}{(x^2 + 2)(2x - 1)} = \frac{ax + b}{x^2 + 2} + \frac{c}{2x - 1}.$$

(see hint in Text, Q.1.1.15)