## MEMORIAL UNIVERSITY OF NEWFOUNDLAND DEPARTMENT OF MATHEMATICS AND STATISTICS

Assignment 2

## MATH 2050 sect. 3 Due: Friday Sept 22

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

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

- 2. Show that the system of 3 equations x + 2y z = a, 2x + y + 3z = b, x 4y + 9z = c has no solutions unless c = 2b 3a. In the latter case, how many solutions does the system have?
- 3. (Partial fraction decomposition): Find a, b, c such that

$$\frac{x^2 - x + 3}{(x^2 + 2)(2x - 1)} = \frac{ax + b}{x^2 + 2} + \frac{c}{2x - 1}$$

(see hint in Text, Q.1.1.15)

4. Solve the given systems by reduction corresponding Augmented Matrix to Reduced Row-Echelon Form (REF).

(a) 
$$\begin{cases} x+y+2z = -1 \\ 2x+y+3z = 0 \\ -2y+z = 2 \end{cases}$$
 (b) 
$$\begin{cases} 5x+y=2 \\ 3x-y+2z = 1 \\ x+y-z = 5 \end{cases}$$

5. Carry each of the following matrices to Reduced REF

(a)	$\left[\begin{array}{rrrr} 1 & -1 & 2 \\ 0 & 0 & 0 \\ 0 & 0 & 1 \end{array}\right]$	(d) $\begin{bmatrix} 1 & -2 & 3 & 5 \\ 0 & 0 & 0 & 1 \end{bmatrix}$
(b)	$\begin{bmatrix} 1 & -1 & 2 & 1 & 2 & 1 & -1 \\ 0 & 1 & -2 & 2 & 7 & 2 & 4 \\ 0 & -2 & 4 & 3 & 7 & 1 & 0 \end{bmatrix}$	(e) $\left[\begin{array}{rrr} 1 & 1 \\ 0 & 1 \end{array}\right]$
(c)	$\begin{bmatrix} 0 & 3 & -6 & 1 & 6 & 4 & 1 \\ 2 & 1 & -1 & 3 \\ 0 & 0 & 0 & 0 \end{bmatrix}$	(f) $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 0 & 1 \\ 0 & 0 & 1 \end{bmatrix}$