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

$$
\frac{x^{2}-x+3}{\left(x^{2}+2\right)(2 x-1)}=\frac{a x+b}{x^{2}+2}+\frac{c}{2 x-1} .
$$

(see hint in Text, Q.1.1.15)
4. Solve the given systems by reduction corresponding Augmented Matrix to Reduced RowEchelon Form (REF).
(a) $\left\{\begin{array}{l}x+y+2 z=-1 \\ 2 x+y+3 z=0 \\ -2 y+z=2\end{array}\right.$
(b) $\left\{\begin{array}{l}5 x+y=2 \\ 3 x-y+2 z=1 \\ x+y-z=5\end{array}\right.$
5. Carry each of the following matrices to Reduced REF
(a) $\left[\begin{array}{ccc}1 & -1 & 2 \\ 0 & 0 & 0 \\ 0 & 0 & 1\end{array}\right]$
(d) $\left[\begin{array}{cccc}1 & -2 & 3 & 5 \\ 0 & 0 & 0 & 1\end{array}\right]$
(b) $\left[\begin{array}{ccccccc}1 & -1 & 2 & 1 & 2 & 1 & -1 \\ 0 & 1 & -2 & 2 & 7 & 2 & 4 \\ 0 & -2 & 4 & 3 & 7 & 1 & 0 \\ 0 & 3 & -6 & 1 & 6 & 4 & 1\end{array}\right]$
(e) $\left[\begin{array}{ll}1 & 1 \\ 0 & 1\end{array}\right]$
(c) $\left[\begin{array}{cccc}2 & 1 & -1 & 3 \\ 0 & 0 & 0 & 0\end{array}\right]$
(f) $\left[\begin{array}{lll}0 & 0 & 1 \\ 0 & 0 & 1 \\ 0 & 0 & 1\end{array}\right]$

