1. Find inverse matrix to the following matrices and check that your answer is correct (their product is identity matrix):

(a) $\begin{pmatrix} 2 & -1 \\ -3 & 2 \end{pmatrix}$

(b) $\begin{pmatrix} 1 & 2 \\ 4 & 7 \end{pmatrix}$

(c) $\begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 1 \\ 2 & 0 & 1 \end{pmatrix}$

2. Find the following determinants:

(a) $\begin{vmatrix} 1 & 0 \\ 0 & 1 \end{vmatrix}$

(b) $\begin{vmatrix} 3 & 2 \\ 1 & 4 \end{vmatrix}$

(c) $\begin{vmatrix} 1 & 2 & 3 \\ -2 & 1 & 0 \\ 3 & -1 & 1 \end{vmatrix}$

3. Solve the system in part (a) using matrix method; system in part (b) using Gauss elimination, and inverse matrix, and system in part (c) using Cramer's rule:

(a) $3x - 2y = -1$
$x + y = 3$

(b) $-2x + 3y = 2$
$x + y = 4$

(c) $x - 2y + z = 7$
$3x - y - z = -2$
$x - y + 2z = 6$