Calculus II - Quiz 2

Please show all your work! Answers without supporting work will not be given credit. Simplify answers wherever possible.

(1) (10 points) Determine whether the following system is overdetermined or undetermined, then solve it

$$2x - 7y + z = 2$$
$$x + y - 2z = 4$$

(2) (10 points)

$$A = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$$

(a) Determine if A is invertible, if it is find it's inverse.
(b) Solve the equation $AX = 0$.

(3) (10 points)

$$B = \begin{bmatrix} 1 & 1 \\ 2 & 2 \end{bmatrix}$$

Given that the eigenvectors of B are $\begin{bmatrix} 1 \\ -1 \end{bmatrix}$ and $\begin{bmatrix} 1 \\ 2 \end{bmatrix}$, find

$$B^{10} \begin{bmatrix} 3 \\ 0 \end{bmatrix}$$

(4) (10 points)

(a) Find the equation of the line passing through $\begin{bmatrix} 1 & 1 & 1 \end{bmatrix}'$ in the direction $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$.

(b) Find the equation of the plane passing through $\begin{bmatrix} 1 & 2 & 3 \end{bmatrix}'$ which is perpendicular to the above line.