Determine if the augmented matrix is in reduced echelon form. If it is, solve.

1.) $\begin{bmatrix} 1 & 0 & 0 & 2 \\ 0 & 1 & 0 & 2 \\ 0 & 0 & 1 & 1 \end{bmatrix}$

2.) $\begin{bmatrix} 1 & 0 & 0 & -7 & 2 & 0 \\ 0 & 1 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 5 & -4 & 0 \end{bmatrix}$

3.) $\begin{bmatrix} 0 & 1 & 0 & 8 & 0 \\ 0 & 0 & 1 & -6 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$

4.) $\begin{bmatrix} 0 & 1 & 0 & 0 & 8 \\ 0 & 0 & 1 & 0 & -4 \\ 0 & 0 & 0 & 1 & 0 \end{bmatrix}$

5.) $\begin{bmatrix} 1 & -4 & 0 & 0 & 3 & 6 \\ 0 & 0 & 1 & 0 & 0 & 3 \\ 0 & 0 & 0 & 1 & -9 & 4 \\ 0 & 0 & 0 & 0 & 1 & -8 \end{bmatrix}$

6.) $\begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 3 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

7.) $\begin{bmatrix} 1 & 8 & -9 & 13 & 0 & 1 & 5 & 2 & 0 & 0 & 2 \\ 0 & 0 & 0 & 0 & 1 & 0 & 1 & 2 & 3 & 4 & 5 \end{bmatrix}$

8.) $\begin{bmatrix} 0 & 1 & 5 & 2 & 0 & 0 & 2 \\ 1 & 0 & 6 & 9 & 0 & 0 & 9 \\ 0 & 0 & 0 & 0 & 1 & 0 & 7 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 \end{bmatrix}$

9.) $\begin{bmatrix} 1 & 0 & 0 & 0 & 5 \\ 0 & 1 & 0 & 0 & -3 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

10.) $\begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 5 \\ 0 & 0 & 1 & 0 & 0 & -3 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

11.) $\begin{bmatrix} 0 & 1 & 0 & -5 & 0 & 0 & 5 \\ 0 & 0 & 1 & 7 & 0 & 0 & -3 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

12.) $\begin{bmatrix} 0 & 0 & 0 & 1 & 0 & -5 & 0 & 3 & 4 & 0 & 5 \\ 0 & 0 & 0 & 0 & 1 & 7 & 0 & 0 & -1 & 0 & -3 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 6 & -9 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

Determine if the augmented matrix is in echelon form. If it is, determine if the corresponding system of equations has no solution, exactly one solution, or an infinite number of solutions. If it has an infinite number of solutions, state the dimension of the hyperplane of the solutions.

1.) $\begin{bmatrix} 1 & 2 & 3 & 4 & 5 \\ 0 & 6 & 7 & 8 & 9 \\ 0 & 0 & 1 & 2 & 3 \\ 0 & 0 & 0 & 4 & 5 \end{bmatrix}$

2.) $\begin{bmatrix} 0 & 1 & 2 & 3 & 3 & 4 & 5 \\ 0 & 0 & 6 & 3 & 7 & 8 & 9 \\ 0 & 0 & 0 & 0 & 1 & 2 & 3 \\ 0 & 0 & 0 & 0 & 0 & 4 & 5 \end{bmatrix}$

3.) $\begin{bmatrix} 0 & 1 & 2 & 3 & 3 & 4 & 5 \\ 0 & 0 & 6 & 3 & 7 & 8 & 9 \\ 0 & 0 & 0 & 0 & 1 & 2 & 3 \\ 0 & 0 & 0 & 0 & 0 & 4 & 5 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

4.) $\left[\begin{array}{ccccccc} 0 & 1 & 2 & 3 & 3 & 4 & 5 \\ 0 & 0 & 6 & 7 & 8 & 9 & 0 \\ 0 & 0 & 0 & 0 & 1 & 2 & 3 \\ 0 & 0 & 0 & 0 & 0 & 4 & 5 \\ 0 & 0 & 0 & 0 & 0 & 0 & 6 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{array}\right]$

5.) $\begin{bmatrix} 0 & 6 & 3 & 7 & 2 \\ 2 & 0 & 5 & 2 & 8 \\ 0 & 0 & 0 & 1 & 4 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

6.) $\begin{bmatrix} 2 & 0 & 5 & 2 & 8 \\ 0 & 6 & 3 & 7 & 2 \\ 0 & 0 & 0 & 1 & 4 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

7.) $\begin{bmatrix} 1 & 7 & 3 & 4 & 3 \\ 0 & 5 & 5 & 6 & 8 \\ 0 & 0 & 2 & 3 & 4 \\ 0 & 0 & 0 & 3 & 4 \\ 0 & 0 & 0 & 0 & 5 \end{bmatrix}$

8.) $\begin{bmatrix} 1 & 7 & 3 & 4 & 3 \\ 0 & 5 & 5 & 6 & 8 \\ 0 & 0 & 2 & 3 & 4 \\ 0 & 0 & 0 & 5 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$

9.) $\begin{bmatrix} 1 & 2 \\ 0 & 4 \end{bmatrix}$

10.) $\begin{bmatrix} 1 & 2 & 0 & 7 \\ 0 & 0 & 3 & 3 \end{bmatrix}$

11.) $\begin{bmatrix} 1 & 4 & 3 & 0 & 4 & 5 & 4 & 9 & 2 & 3 & 5 & 7 & 9 & 3 & 0 \\ 0 & 0 & 5 & 7 & 9 & 2 & 7 & 3 & 8 & 5 & 9 & 5 & 7 & 8 & 2 \\ 0 & 0 & 6 & 1 & 8 & 5 & 4 & 0 & 0 & 3 & 6 & 5 & 7 & 6 & 4 \\ 0 & 0 & 0 & 0 & 0 & 0 & 7 & 8 & 4 & 9 & 0 & 5 & 7 & 7 & 5 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 9 & 5 & 8 & 4 & 7 & 6 & 4 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 2 & 4 & 6 \end{bmatrix}$

12.) $\begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 0 & 0 & 0 & 0 & 1 & 2 & 3 & 4 & 0 & 0 & 0 & 0 & 0 & 5 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$