HOMEWORK 5-PART A

1. (1) Write down the augmented matrix for the system.
(2) Solve the solutions of following linear equation system in terms of parametric form. And draw the solution in xyz-space.

$$x - 3y + 4z = 12,$$
$$-3x + 10y + 8z = 40$$

2. (1) How many possibilities of solutions for the case–"three linear equations in three variables"?
(2) Solve the following linear equation system:

$$x - y + 2z = 4$$
$$-2x + y - z = 6$$
$$3x + y - 3z = 7$$

3. For an $n \times n$ matrix A, the trace of A is defined as the sum of diagonal entries of A. e.g. For $A = \begin{pmatrix} 2 & 1 \\ 1 & 3 \end{pmatrix}$, then trace of A equals to $2 + 3 = 5$.
(1) Now please calculate trace of AB and trace of BA, for $A = \begin{pmatrix} 2 & 1 & 5 \\ 1 & 3 & 7 \\ 2 & 1 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} 9 & 2 & 1 \\ 0 & 1 & 3 \\ 2 & 0 & 8 \end{pmatrix}$. Comparing both, what can you say?
(2) Calculate trace of A and trace of A^T, comparing both, what can you say?