

**King Fahd University of Petroleum and Minerals**  
**Faculty of Science – Prep-Year Math Program**  
**Math 002 - Term 032**  
**Recitation Hour (10.1 & 10.2)**

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**Question1**

Solve the system equations 
$$\begin{cases} 3x - 5y + 2z = 4 \\ x - 3y + 2z = 4 \\ 5x - 11y + 6z = 12 \end{cases}$$
 by Gaussian elimination.

**Question2**

If the augmented matrix of a system of linear equations is

$$\left[ \begin{array}{ccc|c} 1 & 3 & -a^2 & a^2 \\ 0 & 3 & -2a^2 - a & 2a^2 - 2 \\ 0 & 0 & a^2 + 5a - 6 & -a^2 + 1 \end{array} \right], \text{ then}$$

- i. Find all values of  $a$  for which the system of equations has a unique solution.
- ii. Find all values of  $a$  for which the system of equations has infinitely many solutions.
- iii. Find all values of  $a$  for which the system of equations has no solution.

**Question3**

If  $A = \begin{bmatrix} -1 & 2 & 3 \\ 3 & -1 & 1 \end{bmatrix}$ ,  $B = \begin{bmatrix} 0 & 1 & 4 \\ -2 & 3 & -3 \end{bmatrix}$ , then find the matrix  $X$  for which

$$3X + 2B = X - 2A .$$

**Question4**

If  $A = \begin{bmatrix} -1 & 0 \\ 3 & 2 \end{bmatrix}$  and  $B = \begin{bmatrix} 2 & 3 \\ 1 & -1 \end{bmatrix}$ , then find  $A^2 - B^2$ .