PRACTICE EXAM 4 - MATH 111

DATE: Friday, April 9
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Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Use substitution to solve the system of equations $\left\{ \begin{array}{rcrcr} x & + & 5y & = & 9 \\ -2x & - & 7y & = & -12 \end{array} \right\}$

2. Use the augmented matrix method (Gauss-Jordan) to solve the system

$$\left\{ \begin{array}{rcrcrcr} x & - & y & + & z & = & 4 \\ 3x & - & 2y & - & 2z & = & 11 \\ -2x & + & y & - & z & = & -5 \end{array} \right\}$$

3. Solve the matrix equation $X^2 = X + \begin{bmatrix} 20 & -1 \\ 0 & y^2 - y \end{bmatrix}$, where $X = \begin{bmatrix} x & 1 \\ 0 & y \end{bmatrix}$.

4. Find the inverse of $A = \begin{bmatrix} 1 & -1 & 0 \\ 1 & 0 & 1 \\ 3 & -1 & 0 \end{bmatrix}$, if it exists.

5. Let
$$A = \begin{bmatrix} 1 & 5 \\ -2 & 4 \end{bmatrix} \begin{bmatrix} -1 & 0 & -3 \\ 2 & 7 & -5 \end{bmatrix} + \begin{bmatrix} 3 & -1 & 0 \\ 2 & 0 & 11 \end{bmatrix}.$$
Compute A. Show all your work.

6. Let $U = \{a, b, c, d, e, f, g, h, i, j\}, A = \{a, c, f, g, h\}$ and $B = \{b, d, e, h, i\}$. Find $A' \cap B$ and $B' \cup A$.