

- (1) A linear system whose solution set is empty is said to be an _____ system.
- (2) The three elementary row operations are replacement, _____, and _____.
- (3) A linear system's augmented matrix has been put into echelon form. It looks like this:

$$\begin{bmatrix} 1 & 4 & 5 & -9 & -7 \\ 0 & 2 & 4 & -6 & -6 \\ 0 & 0 & 0 & -5 & 0 \end{bmatrix}$$

Find the reduced echelon form of this matrix and find the general form of the solution to the system.

- (1) A linear system whose solution set is empty is said to be an inconsistent system.
- (2) The three elementary row operations are replacement, interchange, and scaling.
- (3) A linear system's augmented matrix has been put into echelon form. It looks like this:

$$\begin{bmatrix} 1 & 4 & 5 & -9 & -7 \\ 0 & 2 & 4 & -6 & -6 \\ 0 & 0 & 0 & -5 & 0 \end{bmatrix}$$

Find the reduced echelon form of this matrix and find the general form of the solution to the system.

$$R2 := \frac{1}{2}R2 \quad \text{and} \quad R3 := -\frac{1}{5}R3$$

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

$$R2 := R2 + 3R3$$

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

$$R1 := R1 - 4R2 + 9R3$$

$$\begin{bmatrix} \textcircled{1} & 0 & -3 & 0 & 5 \\ 0 & \textcircled{1} & 2 & 0 & -3 \\ 0 & 0 & 0 & \textcircled{1} & 0 \end{bmatrix}$$

$$\left\{ \begin{array}{l} x_1 = 5 - 3x_3 \\ x_2 = -3 - 2x_3 \\ x_3 = \text{free} \\ x_4 = 0 \end{array} \right.$$

or...

$$\left\{ \begin{array}{l} x_1 = 5 - 3t \\ x_2 = -3 - 2t \\ x_3 = t \\ x_4 = 0 \end{array} \right.$$