

Name _____

SHOW AS MUCH WORK AS POSSIBLE BECAUSE YOU MAY RECEIVE PARTIAL CREDIT FOR THE WORK YOU DO IF YOUR ANSWER IS INCORRECT.

For each of the following matrices:

- Write the system of equations that corresponds to the matrix.
- Row-reduce the matrix **making sure to clearly show and describe each step**.
- If the system has a single solution, state the solution. If the system is inconsistent, write "inconsistent." If the system is dependent, write the solution set in parameterized form.

$$1. \quad \left(\begin{array}{ccc|c} 1 & 3 & 2 & 6 \\ 1 & 2 & 2 & 3 \\ 2 & 5 & 4 & 8 \end{array} \right)$$

$$\begin{cases} x_1 + 3x_2 + 2x_3 = 6 \\ x_1 + 2x_2 + 2x_3 = 3 \\ 2x_1 + 5x_2 + 4x_3 = 8 \end{cases}$$

$$\begin{array}{l} -R_1 + R_2 \rightarrow \\ -2R_1 + R_3 \rightarrow \end{array} \left(\begin{array}{ccc|c} 1 & 3 & 2 & 6 \\ 0 & -1 & 0 & -3 \\ 0 & -1 & 0 & -4 \end{array} \right)$$

$$-R_2 \rightarrow \left(\begin{array}{ccc|c} 1 & 3 & 2 & 6 \\ 0 & 1 & 0 & 3 \\ 0 & -1 & 0 & -4 \end{array} \right)$$

$$\begin{array}{l} -3R_2 + R_1 \rightarrow \\ R_2 + R_3 \rightarrow \end{array} \left(\begin{array}{ccc|c} 1 & 0 & 2 & -3 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 0 & -1 \end{array} \right)$$

$$-R_3 \rightarrow \left(\begin{array}{ccc|c} 1 & 0 & 2 & -3 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 0 & 1 \end{array} \right)$$

inconsistent

$$2. \quad \left(\begin{array}{ccc|c} 5 & -7 & 3 & -9 \\ -1 & 1 & -1 & 1 \\ 4 & -5 & 3 & -6 \end{array} \right)$$

$$\begin{cases} 5x_1 - 7x_2 + 3x_3 = -9 \\ -x_1 + x_2 - x_3 = 1 \\ 4x_1 - 5x_2 + 3x_3 = -6 \end{cases}$$

$$\begin{array}{l} -R_2 \rightarrow \\ R_1 \rightarrow \end{array} \left(\begin{array}{ccc|c} 1 & -1 & 1 & -1 \\ 5 & -7 & 3 & -9 \\ 4 & -5 & 3 & -6 \end{array} \right)$$

$$\begin{array}{l} -5R_1 + R_2 \rightarrow \\ -4R_1 + R_3 \rightarrow \end{array} \left(\begin{array}{ccc|c} 1 & -1 & 1 & -1 \\ 0 & -2 & -2 & -4 \\ 0 & -1 & -1 & -2 \end{array} \right)$$

$$-\frac{1}{2}R_2 \rightarrow \left(\begin{array}{ccc|c} 1 & -1 & 1 & -1 \\ 0 & 1 & 1 & 2 \\ 0 & -1 & -1 & -2 \end{array} \right)$$

$$\begin{array}{l} R_2 + R_1 \rightarrow \\ R_2 + R_3 \rightarrow \end{array} \left(\begin{array}{ccc|c} 1 & 0 & 2 & 1 \\ 0 & 1 & 1 & 2 \\ 0 & 0 & 0 & 0 \end{array} \right)$$

$$\begin{cases} x_1 = 1 - 2t \\ x_2 = 2 - t \\ x_3 = t \end{cases}$$