

Instructions: Show all work. Use exact answers unless specifically asked to round. Answer all parts of each question.

1. Solve the system below and label the system as consistent or inconsistent, and if a solution exists, as dependent or independent.

$$\begin{cases} 3x + 4y + 2z = 11 \\ 2x + 3y - z = 4 \\ 5x + 5y - 3z = -1 \end{cases}$$

Row reducing the matrix produces $\left[\begin{array}{ccc|c} 1 & 0 & 0 & -3 \\ 0 & 1 & 0 & 4 \\ 0 & 0 & 1 & 2 \end{array} \right]$

$$x = -3, y = 4, z = 2$$

Consistent, independent

2. The admission fee at a small fair is \$1.50 for children and \$4.00 for adults. On a certain day, 2200 people enter the fair and \$5050 is collected. How many children and how many adults attended?

$$\begin{aligned} x + y &= 2200 \\ 1.50x + 4.00y &= 5050 \end{aligned}$$

$$x = 1500 \text{ \# of children}$$

$$y = 700 \text{ \# of adults}$$

3. Row-reduce the matrix to reduced echelon form. If this matrix represented a system of equations, would the solution be inconsistent or consistent, and if applicable, dependent or independent?

$$\left[\begin{array}{ccc|c} 2 & 1 & 2 & 2 \\ 3 & -5 & -1 & 4 \\ 1 & -2 & -3 & -6 \end{array} \right] \rightarrow \left[\begin{array}{ccc|c} 1 & 0 & 0 & -1 \\ 0 & 1 & 0 & -2 \\ 0 & 0 & 1 & 3 \end{array} \right]$$

$$x = -1, y = -2, z = 3$$

Consistent, independent