

Review Problems 3

A total of 385 people attend the premiere of a new movie. Ticket prices are \$11 for adults and \$8 for children. The total revenue is \$3974

1) Express the information in the problem as:

- a) A system of linear equations.
- b) A vector equation.
- c) A matrix equation.

2) Identify and describe a linear transformation relevant to this scenario.

3) Determine how many adults and how many children attended

- a) by reducing to echelon form and backsubstituting.
- b) by diagonalizing.
- c) by finding an inverse matrix.

A total of 385 people attend the premiere of a new movie. Ticket prices are \$11 for adults, \$8 for children, and \$9 for students. The total revenue is \$3974

4) Express the information in the problem using your choice of equation(s).

5) Determine how many adults, children, and students attended (for the purpose of these problems we'll allow for fractions of a person).

6) Identify the free and leading variables. Explain what this means.

7) Suppose that it is known that no matter the prices are, 385 people will attend and they will spend a total of \$3974. Let a , c , and s represent the prices for adults, children, and students. Show that the number of each attending must be:

$$\begin{bmatrix} \text{\#adults} \\ \text{\#children} \\ \text{\#students} \end{bmatrix} = \begin{bmatrix} b - c/a - b \\ a - c/a - b \\ 1 \end{bmatrix} \cdot x + \begin{bmatrix} 298 \\ 87 \\ 0 \end{bmatrix}$$

for some $x \in \mathbb{R}$.