

Math 20

§1.1 Systems of Linear Equations

1. Harry works as the ticket taker at a small town fair at which the admission price is \$1.50 for children and \$4 for adults. Today Harry collected \$5050 in ticket sales. Harry's boss asked him how many children bought tickets today, but Harry forgot to keep separate tallies for adults and children. All he knows is that 2200 tickets were sold. How many children tickets did Harry sell today?
2. Consider the following system of linear equations.

$$\begin{array}{rrcrcl} x & + & 3y & + & z & = & 3 \\ 2x & + & 2y & + & 4z & = & -4 \\ 3x & + & y & - & z & = & 9 \end{array}$$

The corresponding augmented matrix is

$$\left[\begin{array}{cccc} 1 & 3 & 1 & 3 \\ 2 & 2 & 4 & -4 \\ 3 & 1 & -1 & 9 \end{array} \right].$$

Which of the following augmented matrices correspond to a system of linear equations with the same solution set?

- (a) Multiply the first row by 2:

$$\left[\begin{array}{cccc} 2 & 6 & 2 & 6 \\ 2 & 2 & 4 & -4 \\ 3 & 1 & -1 & 9 \end{array} \right]$$

- (b) Multiply the first column by 2:

$$\left[\begin{array}{cccc} 2 & 3 & 1 & 3 \\ 4 & 2 & 4 & -4 \\ 6 & 1 & -1 & 9 \end{array} \right]$$

- (c) Add the first row to the third row:

$$\left[\begin{array}{cccc} 1 & 3 & 1 & 3 \\ 2 & 2 & 4 & -4 \\ 4 & 4 & 0 & 12 \end{array} \right]$$

- (d) Interchange the first and second rows:

$$\left[\begin{array}{cccc} 2 & 2 & 4 & -4 \\ 1 & 3 & 1 & 3 \\ 3 & 1 & -1 & 9 \end{array} \right]$$

- (e) Interchange the first and second columns:

$$\left[\begin{array}{cccc} 3 & 1 & 1 & 3 \\ 2 & 2 & 4 & -4 \\ 1 & 3 & -1 & 9 \end{array} \right]$$