Applications of the Elimination Method

For each problem, write a system of linear equations and solve them using the elimination method.

1. You are planning a picnic for Memorial Day. You need to buy enough hot dogs and hamburgers so that each of your 10 guests can have two servings. You determined that hot dogs cost $0.40 each and hamburgers cost $0.80 each. You have $12 to spend on the hamburgers and hot dogs. How many hot dogs and how many hamburgers should you buy?

2. Your family is planning to take the Amtrak train from Hartford to New York City for a day trip. As a result of some research you learn that your friend Jackie took the train with a group of 3 adults and 5 children and it cost them $269.50. A cousin also took the train to the city with a group of 2 adults and 3 children and it cost them $171.50. Find the price of an adult’s ticket and the price of a child’s ticket.
3. During the 2008-2009 basketball season the UConn women’s team had an incredible undefeated season (39-0) and won the NCAA championship. Maya Moore and Renee Montgomery were the top scorers during the year and together they scored 1,398 points. If Maya scored 110 more points than Renee, how many points did each player score during the season?

4. During the 2008-2009 men’s basketball season, UConn’s Hasheem Thabeet and Jeff Adrien had a total of 746 rebounds. Jeff had 30 fewer rebounds than Hasheem. How many rebounds did Hasheem and Jeff each have during the season?
5. At the upcoming school fair, your class is planning to raise money for a class trip to Washington, DC. You plan to sell your own version of Connecticut Trail Mix. After doing research on the cost of various ingredients, you find you can purchase a mixture of dried fruit for $3.25 per pound and a nut mixture for $5.50 per pound. The class plans to combine the dried fruit and nuts to make their unique Connecticut Trail Mix that sells for $4.00 per pound. After researching the number of people who attended last year’s fair, you anticipate you will need 110 pounds of trail mix. Suppose the cost of making 110 pounds is exactly equal to the revenue from selling the trail mix. How many pounds of dried fruit and how many pounds of mix nuts were used?

6. In question 5, how many pounds will you need to sell in order to make a reasonable profit? Explain your reasoning.

7. Find a system of equations that you solved in Investigation 2 and now solve it using the elimination method.