**Culminating Task: Vacationing in Georgia**

I. Your family is planning to spend a week’s vacation traveling in Georgia. First, your parents need to design a budget for the trip. The trip will begin in Atlanta and they estimate spending $60 on gas, $180 on food, $200 on activities, and $40 on souvenirs. Next, you will visit family in Albany. Your parents estimate the cost for this leg of their journey will be $45 on gas, $50 on food, and $20 on activities. Finally, you all will visit Savannah and estimate spending $90 on gas, $200 on food, $100 on activities, and $75 on souvenirs.

1. Construct a matrix [V] to represent all the costs involved in this vacation.
2. Could a matrix be used instead? Explain.
3. The sales tax in Georgia is 7%. Write a matrix [T] representing the taxes for each expenditure.
4. Compute a cost including tax matrix [C] to represent their anticipated expenditures.
5. What is the entry in matrix [C] denoted as  and what is its meaning?
6. What is the sum of the third row in matrix [C] what does it mean?
7. What is the sum of the first column in matrix [C] and what does it mean?

II. Everyone in your family knows you are an excellent math student. Therefore, whenever math problems arise on this vacation, they ask you to solve them. Solve the following and show or explain how you solved them.

 8. Your father said he had earned the money for this vacation through interest earned in an investment portfolio. He had $25,000 invested in two types of accounts: a municipal bond that earned 3% annual interest and a mutual fund that earned 9% annual interest. If he made $1830.00 in interest for the year, how much was invested in each type of account.

 9. Your aunt and uncle in Albany are planning a birthday party for their youngest child at a skating rink. The cost of admission is $3.50 per adult and $2.25 per child, and there is a limit of 20 people. They have $50 to spend. Determine how many adults and how many children can be invited.

 10. While in Savannah, you met a vendor selling frozen yogurt by the river. He said he had made $565 and used 250 cones that day. If a single-scoop cone cost $2 and a double-scoop cone cost $2.50, how many of each type of cone did he sell?

 11. At Lenox Mall in Atlanta, you and two other members of your family wanted to eat Chinese food. You found a Chinese restaurant and ordered three different luncheon combination platters. Mom ordered 2 portions of fried rice and 1 portion of chicken chow mein. Your sister ordered 1 portion of fried rice, 1 portion of chicken chow mein, and 1 eggroll. You ordered 2 portions of chicken chow mein and 1 eggroll. Your mother’s platter cost $5, your sister’s cost $5.25, and yours cost $5.75. How much did 1 eggroll cost?

 12. You were elected the student council president for the next year at your school. After vacation is over, you have to plan a school carnival for the new school year. You are studying last year’s event and know that 210 people attended last year’s school carnival. The total amount of money collected for tickets was $710. Prices were $5 for regular admission, $3 for students, and $1 for children. The number of regular tickets sold was 10 more than twice the number of children’s tickets sold. Determine how many of each kind of ticket were sold.

III. In order to keep the family occupied during the long time in the car during vacation you make up a cryptogram to have everyone solve. Encode the message

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 and the encoding matrix be  