PROBLEM 3: CARS AND TRUCKS

A car dealership keeps cars and trucks on its lot. It has room for no more than 500 vehicles. Cars cost the dealer an average of $20,000 each, and trucks cost the dealer an average of $12,000 each. To keep the dealership viable, the owner decides to spend at least $7,760,000 purchasing vehicles from the manufacturer. To keep within the budget, the dealer also decides to spend no more than $8,800,000 on purchasing vehicles.

A. Sketch the feasible region relating the number of trucks at the dealership to the number of cars.

B. Suppose that the dealer makes, on average, a profit of $2,000 for each car and $1,500 for each truck. Assuming all cars and trucks will be sold, how many of each type should the dealer purchase? How much profit will be realized?

PROBLEM 4: BALANCING YOUR WORKLOAD

To pay for car insurance and other expenses, you need to work during the school year. Although you would prefer not to go to your job Monday through Thursday, your employer insists that you work at least four hours total during those days to keep your job, which pays $6 per hour. Your parents are concerned about your grades and insist that you must study at least twice as many hours as you work on Monday through Thursday. You figure you have no more than 24 hours on Monday through Thursday to devote to a combination of work and study.

A. Sketch the feasible region, relating the hours you spend studying on Monday through Thursday with the hours you spend working.

B. Suppose as an incentive and to help you make ends meet, your parents pay you $2 for every hour that you study on Monday through Thursday. How many hours should you work and how many hours should you study to maximize your income from these four days. How much income would your receive?