Linear Programming Word Problems

1. Delores arrives at school late because her car broke down, and therefore, has only 45 minutes to complete a history exam. The exam has 2 open-ended questions and 30 multiple-choice questions. Each correct open-ended question is worth 20 points, and each multiple-choice question is worth 2 points. She knows that it usually takes her 15 minutes to answer an open-ended question and only one minute to answer a multiple-choice question. Assume that for each question Delores answers, she receives full credit. How many of each type of question should she answer to receive the maximum possible points? What is the maximum possible points that Delores can receive?

2. Econojet Airlines sells business class and tourist class seats for its charter flights. To charter a plane, at least 5 business class tickets must be sold and at least 9 tourist class tickets must be sold. The plane does not hold more than 30 passengers. Econojet makes $40 profit for each business class ticket sold and $45 profit for each tourist class ticket sold. In order for Econojet Airlines to maximize its profits, how many of each type of ticket should they sell? What is the maximum profit?

3. S.A. Electronics manufactures portable tape players and CD players. The manufacturing plant has the capacity to manufacture at most 750 tape players and 500 CD players in one month. It takes 2 hours to make a tape player and 5 hours to make a CD player. The company can spend no more than 3000 hours manufacturing these products. S.A. Electronics makes $4 profit on tape players and $7 profit on CD players. To maximize profits, how many tape players and how many CD players should they make? What is the maximum profit?

4. Student Council is having a talent show. According to school policy, no more than 450 student tickets may be sold and no more than 250 general admission tickets may be sold. It costs $0.50 per ticket to advertise the show to the students and $1 per ticket to advertise the show to the general public. The advertising budget is $300 for this show. Student Council charges $5 for a student ticket and $8 for a general admission ticket. How many of each type of ticket should they sell to make the maximum profit? What is the maximum profit?