LINEAR PROGRAMMING SAMPLE QUESTIONS

You study the following questions and you *can* bring the solutions as homework assignment to get bonus (it is not compulsory). Deadline for submission in case you decide as bonus assignment is **the first week after Eid vacation.**

1. A tennis-playing golfer has \$15 to spend on golf balls (x) costing \$1 each and tennis balls (y) costing 60 c each. He must buy at least 16 altogether and he must buy *more* golf balls than tennis balls.

(a) What is the greatest number of balls he can buy?

(b) After using them, he can sell golf balls for 10c each and tennis balls for 20 c each. What is his maximum possible income from sales?

2. A man has a spare time job spraying cars and vans. Vans take 2 hours each and cars take 1 hour each. He has 14 hours available per week. He has an agreement with one firm to do 2 of their vans every week. Apart from that he has no fixed work.

His permission to use his back garden contains the clause that he must do at least twice as many cars as vans. Let x be the number of vans sprayed each week. Let y be the number of cars sprayed each week.

(a) Write down three inequalities which must be satisfied

(b) Draw a graph and use it to list all possible combinations of vehicles which he can spray each week.

3. A travel agent has to fly 1000 people and 35000 kg of baggage from London to Paris. Two types of aircraft are available: A which takes 100 people and 2000 kg of baggage, or B which takes 60 people and 3000 kg of baggage. He can use no more than 16 aircrafts altogether.

(a) What is the smallest number of aircraft he could use?

(b) If the hire charge for each aircraft A is \$10000 and for each aircraft B is \$12000, find the cheapest option available to him.

(c) If the hire charges are altered so that each A costs \$10000 and each B costs \$20000, find the cheapest option now available to him.

4. A farmer needs to buy up to 25 cows for a new herd. He can buy either brown cows (x) at \$50 each or black cows (y) at \$80 each and he can spend a total of no more than \$1600. He must have at least 9 of each type. On selling the cows he makes a profit of \$50 on each brown cow and \$60 on each black cow. How many of each sort should he buy for maximum profit?