MATH230 Week 11 Worksheet - Linear Programming

1: A nutritionist at the Medical Center has been asked to prepare a special diet for certain patients. She has decided that the meals are to be prepared from Foods A and B and that the meals should contain a minimum of 400 mg of calcium, 10 mg of iron, and 40 mg of vitamin C. Each ounce of Food A contains 30 mg of calcium, 1 mg of iron, 2 mg of vitamin C, and 2 mg of cholesterol. Each ounce of Food B contains 25 mg of calcium, 0.5 mg of iron, 5 mg of vitamin C, and 5 mg of cholesterol. How many ounces of each type of food should be used in a meal so that the cholesterol content is minimized, and the minimum requirements of calcium, iron, and vitamin C are met?

2: Ali Baba gets into a cave full of gold and diamonds. He has one sack with him. A sack full of gold weighs 200 pounds, while a sack full of diamonds weighs 40 pounds. The empty sack does not weigh anything. A pound of gold is worth 20 coins, and a pound of diamonds is worth 60 coins. How many coins can Ali Baba earn for the treasure if he can carry away only 100 pounds?

3: Answer the following true/false questions:

(a): An optimal solution of a linear programming problem is a feasible solution, but a feasible solution of a linear programming problem need not be an optimal solution.

(b): An optimal solution of a linear programming problem can occur inside the feasible set of the problem.