

Math 7502

Homework 1

Due: January 17, 2008

1. Describe and graph the region in the first quadrant of the x_1x_2 -plane determined by the linear inequalities:

$$5x_1 + 10x_2 \leq 50, \quad x_1 + x_2 \leq 6, \quad 10x_1 + 5x_2 \leq 50.$$

2. Maximize the daily profit in manufacturing two alloys A_1 and A_2 which are different mixtures of two metals M_1 and M_2 as shown:

Metal	Proportion of metal In Alloy A_1	Proportion of metal In Alloy A_2	Daily supply in tons
M_1	0.5	0.25	10
M_2	0.5	0.75	15
Net Profit per ton	30	25	

Solve the program graphically in the xy -plane. Write it in matrix form. Write this program in canonical form. What is the meaning of the two slack variables needed? Find all basic solutions in canonical form. Which ones are feasible? Find the basic feasible solutions in standard form.