King Fahd University of Petroleum and Minerals

Major 2 Math 131-122

April 6, 2013

Prob. 1

Maximize $W = 2x_1 + x_2 - 2x_3$, subject to

$$\begin{cases} -2x_1 + x_2 + x_3 \geq -2 \\ x_1 - x_2 + x_3 \leq 4 \\ x_1 + x_2 + 2x_3 \leq 6 \\ x_1, x_2, x_3 \geq 0. \end{cases}$$

Prob. 2

Suppose that you have \$9000 to invest.

(a) If you invest with Riyad Bank at the nominal rate of 5% compounded quarterly, find the accumulated amount at the end of one year.

(b) Riyad bank also offers certificates on which it pays 5.5% coumpounded continuously. However, a minimum investment of \$10,000 is required. Because you have only \$9000, the bank is willing to give you a 1-year loan for the extra \$1000 that you need. Interest for this loan is at an effective rate of 8%, and both principal and interest are payable at the end of the year. Determine whether or not this strategy of investment is preferable to the startegy in part (a).

Prob. 3

Solve the system

$$\begin{cases} x + y + 7z = 0 \\ x - y - z = 0 \\ 2x - 3y - 6z = 0 \\ 3x + y + 13z = 0 \end{cases}$$