Mini Exam 2 Practice

1. Consider a variation of problem 3-44 in the textbook. Consider the same investment options as given in the problem and the same initial cash amount, but assume that the goal is simply to maximize the amount of money Monica has at the end of the 5 year time span You can ignore the constraint that puts an upper limit of $120,000 on the investment in each fund in every year. Clearly write down the three steps of the linear program: define the decision variables, write down the objective and constraints in terms of the decision variables. Additional questions:

   - Does the optimal solution change if instead Monica starts with $400,000? Use the Sensitivity Reports. In other words

   - Reformulate the problem assuming that her investment in Fund D must be at least twice as large as her investment in Fund A in year one.

2. Indiana Jones comes upon a cave with 6 gold pieces! Unfortunately his backpack only has enough room to fit 4 of them. Luckily he has a jewelry expert with him who tells him that the six pieces have the following values: $10, $7, $20, $8, $15, $3. Indiana must decide which pieces to put in his backpack. Formulate the problem as a linear program. How much would Indiana be willing to pay for an add-on to his backpack that would allow him to fit one more gold piece? The jewelry expert made a mistake and mis-priced the first item at $10 when it is really worth $6.50. Does this change the optimal solution? **Bonus:** Argue that we do not need to impose an integrality constraint by formulating the problem as a max revenue flow problem (Same thing as min cost flow but instead of having a cost for shipping across an arc we can gain a revenue from using an arc).