MIG

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**Unit 2 Review 2** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Setting up and solving LP problems with Excel

Use the SOLVER feature of Excel to find the maximum values of the following problems.

1. A gold processor has two sources of gold ore, source A and source B. In order to keep his plant running, at least three tons of ore must be processed each day. Ore from source A costs $20 per ton to process, and ore from source B costs $10 per ton to process. Costs must be kept to less than $80 per day. Moreover, Federal Regulations require that the amount of ore from source B cannot exceed twice the amount of ore from source A. If ore from source A yields 2 oz. of gold per ton, and ore from source B yields 3 oz. of gold per ton, how many tons of ore from both sources must be processed each day to maximize the amount of gold extracted subject to the above constraints?

Decision Variables: Constraints:

Objective Function:

 Optimal Solution: Maximum Amount:

1. A farmer has 10 acres to plant in wheat and rye. He has to plant at least 7 acres. However, he has only $1200 to spend and each acre of wheat costs $200 to plant and each acre of rye costs $100 to plant. Moreover, the farmer has to get the planting done in 12 hours and it takes an hour to plant an acre of wheat and 2 hours to plant an acre of rye. If the profit is $500 per acre of wheat and $300 per acre of rye how many acres of each should be planted to maximize profits?

Decision Variables: Constraints:

Objective Function:

 Optimal Solution: Maximum Profit:

1. The Bead Store sells material for customers to make their own jewelry. Customer can select beads from various bins. Grace wants to design her own Halloween necklace from orange and black beads. She wants to make a necklace that is at least 12 inches long, but no more than 24 inches long. Grace also wants her necklace to contain black beads that are at least twice the length of orange beads. Finally, she wants her necklace to have at least 5 inches of black beads.  What is the maximum necklace length she can make using the orange and black beads?

Decision Variables: Constraints:

Objective Function:

 Optimal Solution: Maximum Length:

1. A manufacturer makes wooden desks and tables. Each desk requires 2.5 hours to assemble, 3 hours for buffing, and 1 hour to crate. Each table requires 1 hour to assemble, 3 hours to buff, and 2 hours to crate. The firm can do only up to 20 hours of assembling, 30 hours of buffing, and 16 hours of crating per week. Profit is $3 per desk and $4 per table. How many desks and chairs should be made in order to maximize the profit?

Decision Variables: Constraints:

Objective Function:

 Optimal Solution: Maximum Profit: