

Name _____ Date _____ Period _____

Objective: Students will be able to use linear programming to find the optimal production policy for management science problems.

Directions: Complete all work on loose leaf and/or graph paper. Graphs must be done on graph paper. For each mixture problem, include the following in your solution.

1. A mixture chart
 2. A list of resource-constraint inequalities
 3. A graph of the feasible region
 4. An evaluation of each corner point to find the optimal production policy
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1. Roberta will plant at most 100 acres of her farm with asparagus and corn. She can spend no more than \$9600 to grow these two crops. Asparagus costs \$80 per acre to plant and results in a profit of \$110 per acre. Corn costs \$150 per acre to plant and results in a profit of \$260 per acre. How many acres of each crop should Roberta plant to maximize her profit? What is the maximum profit?
 2. A small manufacturing company produces two items: chairs and tables. Each chair requires 3 feet of lumber and each table requires 7 feet of lumber to make. A chair requires 2 labor-hours of time and a table requires 8 labor-hours of time. The company has 420 feet of lumber in the warehouse and 400 labor-hours available. The profit on a chair is \$2 and the profit per table is \$3. How many of each item should they produce in order to make the largest profit?
 3. A specialty store makes its own blends of herbal tea. The owner wants to make up to a 5 pound blend of chamomile and green tea. The owner can spend no more than \$100 on the teas for the blend. Chamomile tea costs \$18 per pound and green tea costs \$25 per pound. The owner will price the blend so that profit on the chamomile is \$9 per pound and the profit on the green tea is \$11 per pound. How much of each type of tea should the owner use in the blend to make the greatest profit?
 4. A merchant plans to sell two models of Blue-Ray players that cost him \$250 and \$400. The \$250 model profits him \$45 and the \$400 model profits him \$50. The merchant estimates that he will sell no more than 250 units in a month. The merchant has \$70,000 to invest in the inventory. How many units of each model should he stock in order to maximize profit?