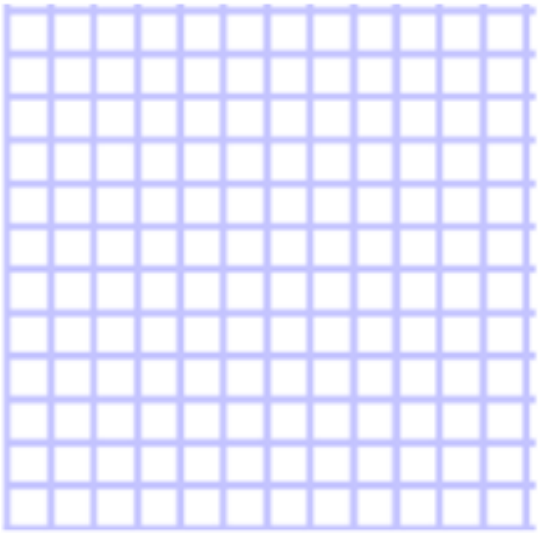
Math Analysis
Linear Programing Worksheet

1. You are going to make and sell bread. A loaf of Irish soda bread is made with 2 c flour and ¼ c sugar. Kugelhopf cake is made with 4 c flour and 1 c sugar. You will make a profit of $1.50 on each loaf of Irish soda bread and a profit of $4 on each Kugelhopf cake. You have 16 c flour and 3 c sugar. How many of each kind of bread should you make to maximize the profit? What is the maximum profit?



2. Suppose you make and sell skin lotion. A quart of regular skin lotion contains 2 c oil and 1 c cocoa butter. A quart of extra-rich skin lotion contains 1 c oil and 2 c cocoa butter. You will make a profit of $10/qt on regular lotion and a profit of $8/qt on extra-rich lotion. You have 24 c oil and 18 c cocoa butter. How many quarts of each type of lotion should you make to maximize your profit? What is the maximum profit?

3. You need to buy some filing cabinets. You know that Cabinet X costs $10 per unit, requires six square feet of floor space, and holds eight cubic feet of files. Cabinet Y costs $20 per unit, requires eight square feet of floor space, and holds twelve cubic feet of files. You have been given $140 for this purchase, though you don't have to spend that much. The office has room for no more than 72 square feet of cabinets. How many of which model should you buy, in order to maximize storage volume?

4. In order to ensure optimal health (and thus accurate test results), a lab technician feeds to the rabbits a daily diet containing a minimum of 24 grams (g) of fat, 36 g of carbohydrates, and 4 g of protein. But the rabbits should be fed no more than five ounces of food a day. Rather than order rabbit food that is custom-blended, it is cheaper to order Food x and Food y, and blend them for an optimal mix. Food x contains 8 g of fat, 12 g of carbohydrates, and 2 g of protein per ounce, and costs $0.20 per ounce. Food y contains 12 g of fat, 12 g of carbohydrates, and 1 g of protein per ounce, at a cost of $0.30 per ounce. What is the optimal blend to minimize the cost?