1. Cardinal Furniture Company produces chairs and tables. To produce a chair the company uses 3 yards of fabric, 2 board-feet of lumber and 30 minutes of assembly workers’ time. To produce a table the company uses 0 yards of fabric, 4 board-feet of lumber, and 15 minutes of assembly workers time. The company wants to plan how many chairs and tables to make so as to maximize their proﬁt. The company knows that each chair will yield a $60 proﬁt and each table will yield a $50 proﬁt. On Monday there are 1500 yards of fabric, 3000 board-feet of lumber, and 300 hours of assembly workers’ time available. How many chairs and tables should be produced on Monday in order to give the largest possible proﬁt?
2. Cardinal fruits is making two kinds of fruit assortments out of 4 kinds of fruit. The Legend assortment contains 4 apples, 4 grapefruit, 9 oranges, and 2 kiwis, and sells for $28.95. The Supreme assortment contains 12 apples, 4 grapefruit, 4 oranges, and no kiwis, and sells for $23.95. Each apple costs the company $0.20, each grapefruit costs $0.25, each orange costs $0.30, and each kiwi costs $0.50. This week the company has available 9600 apples, 4000 grapefruit, 7200 oranges, and 1400 kiwis. Assuming they can sell all the assortments they can make, how many of each type assortment should Cardinal Fruits make this week in order to maximize their profit?
3. A farmer has 100 acres on which to plant two crops: corn and wheat. Each acre of corn will take 2 workdays to cultivate, and each acre of wheat will take 4 work-days. There are 300 word-days available for cultivation. Each acre of corn yields 40 bushels, and each acre of wheat yields 24 bushels, but there are only storage facilities for 3,600 bushels of grain. The farmer makes a profit of $3.60 per bushel for corn and $3.50 per bushel of wheat. How many acres of corn and how many acres of wheat should the farmer plant to maximize his net profit?
4. An arts and crafts shop makes flower arrangements, baskets, and centerpieces. The costs of the materials (of which the shop has all it needs) are the same for each, but they require specialized skill from each of the three workers. An arrangement requires 2 minutes by Joan, 6 minutes by Beth, and 4 minutes by Carol. A basket requires 6 minutes by Joan, 10 minutes by Beth, and 8 minutes by Carol. A centerpiece requires 10 minutes by Joan, 8 minutes by Beth, and 16 minutes by Carol. The shop makes a profit of $10 on each arrangement, $25 on each basket, and $35 on each centerpiece. This month Joan is scheduled to work 80 Hours, But Beth and Carol will work 200 hours each. How many arrangements, baskets, and centerpieces should the shop make this month to maximize its profit? (Assume they can sell all the items they make.) Is it feasible for the Shop to make 300 arrangements, 250 baskets, and 250 Centerpieces? If so, what is the profit? NOTE: YOU CAN NOT OPTIMIZE THIS PROBLEM WITH TECHNIQUES FROM THIS CLASS!!!