

## The Simplex Method (Sec 6.3)

\*Non-Graphical way to solve linear programming problems. Let's solve 6.2, #25:

**25. Resource Allocation** You manage an ice cream factory that makes two flavors: Creamy Vanilla and Continental Mocha. Into each quart of Creamy Vanilla go 2 eggs and 3 cups of cream. Into each quart of Continental Mocha go 1 egg and 3 cups of cream. You have in stock 500 eggs and 900 cups of cream. You make a profit of \$3 on each quart of Creamy Vanilla and \$2 on each quart of Continental Mocha. How many quarts of each flavor should you make in order to earn the largest profit? [**Hint:** See [Example 2.](#)]

\*Now let's solve it using the Simplex Method.

### **STEP 1: Introduce Slack Variables**

### **STEP 2: Set Up the Tableau**

### **STEP 3: Find the pivot column, then find the pivot by testing the ratio**

**STEP 4: Clear the pivot column. If the bottom row has all non-negative entries, we are done. If not, repeat steps 1 - 4.**

2) The Acosta Souvenir Company makes a profit of \$6, \$5 and \$4 for each type-A, type-B and type-C souvenirs. To manufacture a type-A souvenir requires 2 minutes on machine I, 1 minute on machine II, and 2 minutes on machine III. A type-B souvenir requires 1 minute on machine A, 3 minutes on machine II and 1 minute on machine III. A type-C souvenir requires 1 minute on machine I, and 2 minutes on each of machines II and III. Each day, there are 3 hours available on machine I, 5 hours available on machine II and 4 hours available on machine III for manufacturing souvenirs. How many souvenirs of each type should Acosta Souvenirs make per day in order to maximize its profit?