

MA 162 Recitation Worksheet Thursday October 16

1. Solve the linear programming problem using the vertex method **and** simplex method.

$$\begin{aligned} \text{Maximize } P &= 10x + 12y \\ \text{subject to } x + 2y &\leq 12 \\ 3x + 2y &\leq 24 \\ x \geq 0, y &\geq 0 \end{aligned}$$

2. (a) If you are given a simplex tableau, how do you determine whether the optimal solution has been reached?
(b) In the simplex method, how is a pivot column, pivot row or pivot element selected?
(c) Assume that you are using vertex method to solve a linear programming problem and you realize that the optimal solution is reached at two vertices. What can you say in such case.
3. Kane Manufacturing has a division that produces two models of hibachis, model A and model B. To produce each model A hibachi requires 3 lb of cast iron and 6 min of labor. To produce each model B hibachi requires 4 lb of cast iron and 3 min of labor. The profit for each model A hibachis is \$2 and the profit for each model B hibachi is \$1.5. If 1000 lb of cast iron and 20 labor-hours are available for the production of hibachis each day, how many hibachis of each model should the division produce in order to maximize Kane's profit? What is the largest profit the company can realize? Is there any raw material left over?
4. Write the following system of linear equations in the form $AX = C$. Find A^{-1} and use the result to solve the system.

$$\begin{aligned} x - 2y + 4z &= 13 \\ 2x + 3y - 2z &= 0 \\ x + 4y - 6z &= -19. \end{aligned}$$