32. Discuss changes of the objective function coefficient of chairs as well as changes in the rhs of the lumber and of the carpentry constraint for the Dakota problem (refer to Example 6.4 in class).

33. Work on problems 6 and 7 of Section 6.3 in the textbook.

34. Find the duals of the LPs from Homework Problems 19, 25, and Example 4.7 (g) in the lecture notes.

35. Work on problems 5 and 6 of Section 6.5 in the textbook.

36. Find the duals to the following LPs in a form which is as simple as possible. Here, $A \in \mathbb{R}^{(m,n)}$, $B \in \mathbb{R}^{(k,n)}$, $c, x \in \mathbb{R}^n$, $b \in \mathbb{R}^m$, and $d \in \mathbb{R}^k$.

(i) $\begin{cases} c^T x \to \min \\ Ax = b \\ Bx \geq d \end{cases}$
(ii) $\begin{cases} c^T x \to \min \\ Ax \leq b. \end{cases}$

37. Solve

$$\begin{cases} 8x_1 + 10x_2 + 18x_3 & \to & \min \\ x_1 + x_2 + x_3 - x_4 & \geq & 2 \\ -x_2 - 3x_3 - x_4 & \leq & 3 \\ x_1, x_2, x_3, x_4 & \geq & 0 \end{cases}$$

by solving the dual LP graphically and using the complementary conditions.

38. Solve each of the following LPs by solving the dual LP and using the complementary conditions:

(i) $\begin{cases} 7x_1 + 10x_2 & \to & \min \\ x_1 + x_2 & \geq & 1 \\ x_1 + 2x_2 & \geq & 3 \\ x_1, x_2 & \geq & 0 \end{cases}$
(ii) $\begin{cases} 18x_1 + 4x_2 + 16x_3 & \to & \min \\ x_1 + x_2 + x_3 - x_4 & = & 1 \\ x_1 - x_2 + 2x_3 - x_5 & = & 1 \\ x_1, x_2, x_3, x_4, x_5 & \geq & 0 \end{cases}$

(iii) $\begin{cases} 10x_1 + 24x_2 & \to & \min \\ x_1 & \geq & 1 \\ 3x_2 & \geq & 3 \\ 2x_1 + x_2 & \geq & 5 \\ x_1, x_2 & \geq & 0 \end{cases}$
(iv) $\begin{cases} \sum_{k=1}^{5} kx_k & \to & \min \\ x_1 + x_3 - x_4 + x_5 & \geq & -1 \\ x_3 + x_5 & \geq & 2 \\ x_1 + x_2 - x_3 + x_4 & \geq & -3 \\ -x_1 + x_2 + x_3 & \geq & 4 \\ x_1, x_2, x_3, x_4, x_5 & \geq & 0. \end{cases}$