Show all your steps to get full credit.

Problem 1 (20 points): Answer questions 3 and 4 of the case.

Problem 2 (20 points): Consider the following linear program:

Max $3x_1 + x_2$
S.t. $-2x_1 + x_2 \leq 2$
     $x_1 + x_2 \leq 6$
     $x_1 \leq 4$
     $x_1, x_2 \geq 0$

(a) (5 points) Put this LP into standard form.
(b) (10 points) Use the simplex search to solve this LP. At each iteration, find simplex directions, identify an improving simplex direction (if any), identify which variable enters the basis and which variable leaves the basis, and compute the new basic feasible solution.
(c) (5 points) Plot the feasible region and at least one objective function contour. On your plot, show how the simplex search progressed.

Problem 3 (10 points): The following plot shows several feasible points in a linear program and contours of its objective function.

Determine whether each of the following sequences of solutions could have been followed by the simplex algorithm applied to the corresponding LP in standard form. Explain.

(a) A, G, F, D
(b) G, F, E, D
(c) A, H, D
(d) C, B, A, G, F
(e) A, F, D