

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
15.053– Optimization Methods in Management Science (SPRING 2013)
Information about Quiz 2.

The problems for Quiz 2 will drawn from the problem types described below. We will assume that all linear programs are maximization problems.

The italicized words are vocabulary that may be used in the questions on the quiz.

Material from lectures 3 and 4.

1. Given an LP with two variables, graph the feasible region, and indicate whether there is a *redundant* constraint, and determine the *optimum solution* and *optimum solution value* using the *geometric method*.
2. Given a shape in two dimensions, determine whether it is *convex*. If it is convex, know how to identify the *corner (extreme) points*.
3. Given three labeled points in a feasible region of two dimensions, identify whether there is some objective function for which the first two points are optimal, but the third point is not optimal.
4. Know how to convert inequality constraints into equality constraints using slack or surplus variables.
5. Know how to recognize whether a *tableau* is in *canonical form*.
6. Given a *tableau* in *canonical form*, identify the *basic variables*, the *nonbasic variables*, and the *basic feasible solution*.
7. Given a tableau that is in *canonical form*, determine the *entering variable* or determine that the current solution is optimal.
8. Given a tableau in canonical form and the entering variable, know how to use the Δ *method* for finding improved solutions (corresponding to an *edge* of the feasible region). Know how to identify the next basic feasible solution and the *leaving variable* or determine that the objective value is *unbounded from above*.
9. If the *bfs* for a tableau is not optimal, be able to identify the element of the tableau on which to *pivot*. Given an element of the tableau, know how to pivot on that element in order to create a new tableau. This includes being able to compute all coefficients of the new tableau.

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