

# Test #1 — Outline

## Formulation of LP's

- assumptions (certainty, linearity, divisibility)
- decision variables
- objective function, constraints
- algebraic simplification
- standard inequality form ( $\max/\min cx, Ax \{ \leq, \geq, = \} b, x \geq 0$ )
- feasible solutions, optimal solutions

## Geometric Representation

- hyperplanes, half spaces, normal vectors
- feasible region (FR) as intersection of half spaces
- bounded, unbounded FR
- unbounded objective function
- alternative optimal solutions
- degeneracy
- solution by geometric method
- convex sets, extreme points, extreme directions
- representation of FR by extreme points, extreme directions

## Algebraic Representation

- standard *equality* form ( $\max cx, Ax = b, x \geq 0$ )
- basic variables, nonbasic variables
- matrix formulation
- basic feasible solution (BFS), basic infeasible solution
- degeneracy of BFS
- optimality of BFS, reduced costs
- uniqueness
- simplex method
  - move to adjacent BFS
  - equivalent systems