Optimization methods

HW 5. Due December 1 2010.

1. Penalty method

   Use the penalty function and the congugate gradient method to find

   $$\min(x^3 + y^3 - xy) \quad /x < 0, y < 0, x^2 + y^2 \leq 2$$

   Use the quadratic penalty function absolute value penalty, and penalty function

   $$p(x, A, \epsilon) = A\sqrt{x^2 + \epsilon^2}$$

   where A and ϵ are parameters that you may assign.

2. Solve by the Augmented Lagrangian Method

   $$\min(x + y) \quad /y \geq \frac{3}{1 + x^2}, \quad x \geq 0.$$

3. Solve by the barrier method and the congugate gradient method

   $$\min(\exp(x + y^2)) \quad /x > 2, y > 4$$

4. Solve the quadratic program by any method

   $$\min(x^2 + y^2 + z)$$

   subject to

   $$x + 2z = 3, \quad x + y + z \geq 2$$