

UC Berkeley  
Department of Electrical Engineering and Computer Science

EECS 227A  
NONLINEAR AND CONVEX OPTIMIZATION

**Problem Set 2**

Fall 2009

**Issued:** Tuesday, September 8

**Due:** Tuesday, September 22, 2009

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**Reading:** Sections 1.2—1.3 of Nonlinear programming by Bertsekas. (**Note:** Be sure to use the scanned PDFs on webpage to obtain the correct numbering of the problems in this assignment.)

**Problem 2.1**

Bertsekas, Problem 2.1. (p. 47). Minimizing function of two variables.

**Problem 2.2**

Bertsekas, Problem 2.2 (p. 47). Steepest descent for  $\|x\|^{2+\beta}$ .

**Problem 2.3**

Bertsekas, Problem 2.3 (p. 47). Steepest descent for  $\|x\|^{3/2}$ .

**Problem 2.4**

Bertsekas, Problem 2.8 (p. 49). Stationary for modified gradient method.

**Problem 2.5**

Bertsekas, Problem 2.12 (p. 50). Behavior near saddle point.

**Problem 2.6**

Bertsekas, Problem 3.1 (p. 76). Convergence rate of line minimization.

**Problem 2.7**

Bertsekas, Problem 3.4 (p. 76). Steepest descent with errors.

**Problem 2.8**

Bertsekas, Problem 3.9 (pp. 78–79). Heavy ball method.