Operations Research, Spring 2014
Homework 8

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Note. You do not need to submit this homework.

1. Consider the NLP

$$\begin{aligned} \max \quad & x_1 - x_2 \\ \text{s.t.} \quad & x_1^2 + x_2^2 \leq 4 \\ & x_1^2 + (x_2 + 2)^2 \geq 4. \end{aligned}$$

   (a) Write down its KKT condition.
   (b) Show that $(\sqrt{3}, -1)$ satisfies the KKT condition.
   (c) Show that $(2, 0)$ violates the KKT condition.

2. Solve the NLP

$$\begin{aligned} \max \quad & x_1 - x_2 \\ \text{s.t.} \quad & x_1^2 + x_2^2 \leq 4 \\ & x_1^2 + (x_2 + 2)^2 \leq 4. \end{aligned}$$