Problem Sheet 6
DRE 7007 Mathematics

BI Norwegian Business School

Problems

1. Find the minimum of the function $f(x,y,z) = 2x^2 + y^2 + 3z^2$ defined on the set

$$D = \{(x,y,z) \in \mathbb{R}^3 : x - y + 2z \geq 3, x + y \geq 3\}$$

using the Kuhn-Tucker conditions.

2. Find the maximum and minimum of the function $f(x,y) = (xy - x - y + 1)e^{x+y-2}$
defined on the set
$$D = \{(x,y) \in \mathbb{R}^2 : x^2 + y^2 = 1\}$$

What happens if we change the constraint to $x^2 + y^2 \leq 1$?

3. Find the maximum of the function $f(x,y) = xy + xz - yz$ defined on the set

$$D = \{(x,y,z) \in \mathbb{R}^3 : x^2 + y^2 + z^2 \leq 1\}$$

using the Kuhn-Tucker conditions.

Keep answers as short and to the point as possible. Answers must be justified.