

**ECON3120/4120 – Mathematics 2, autumn 2006**

**Problems for seminar no. 11, 20/11–24/11.**

**1** Exam problem 121.

**2** (a) Solve the problem minimize  $(x-2)^2 + (y-2)^2$  s.t.  $\begin{cases} x + y \leq 2, \\ x^2 - 4x + y \leq -2. \end{cases}$

(b) Can you give a geometric interpretation of the problem and thereby confirm the answer in part (a)?

**3** Consider the problem

$$\max f(x, y) = cx + y \quad \text{s.t.} \quad g(x, y) = x^2 + 3y^2 \leq 2, \quad x \geq 0, \quad y \geq 0$$

(a) Write down the necessary Kuhn–Tucker conditions.

(b) Solve the problem for all values of the constant  $c$ .

(c) Let  $V(c)$  denote the maximum value of  $f(x, y)$  as a function of  $c$ . Find  $V(c)$  for all values of  $c$ , and show that it is continuous everywhere.

**4** Exam problem 66.

**5** Exam problem 99.

**6** Exam problem 59.