B.E. International Program

Faculty of Economics, Thammasat University

EE 320 Introductory Mathematical Economics (Section 046402)

Semester 1/2013

Quiz 6 (a)

Given the utility maximization problem

$$\max_{x,y} U(x,y) = xy + 2x + y$$

Subject to

$$3x + 4y = 61$$

1. (6 point) Form the Lagrangian function. Then, find the stationary points and the corresponding utility level.

Ans.

$\mathcal{L}(x, y, \lambda) = xy + 2x + y + \lambda[61 - 3x - 4y]$

FONC:

$\mathcal{L}_x = y + 2 - 3\lambda = 0$

$\mathcal{L}_y = x + 1 - 4\lambda = 0$

$\mathcal{L}_\lambda = 61 - 3x - 4y = 0$

⇨ (x*, y*) = (11, 7) and U* = 106

2. (4 points) Write down the bordered Hessian matrix, and verify that the second-order sufficient condition is met.

Ans.

$$|\bar{H}| = \begin{vmatrix} 0 & 3 & 4 \\ 3 & 0 & 1 \\ 4 & 1 & 0 \end{vmatrix} = 24 > 0$$