University of Ottawa
ECO 3145 Mathematical Economics I
Fall 2019, Professor Shiell

Quiz 2

Total points: 14

1. (5) Is the vector $z = [5.2 \;\; 7.6]$ a convex combination of $u = [10 \;\; 6]$ and $v = [4 \;\; 8]$? Prove your answer.

2. Consider the function $f(x_1, x_2) = -x_1 x_2$.

   a.) (7) Using Theorem I of concave (convex) functions (the one with a derivative in it), determine whether the function is concave, convex, strictly concave, strictly convex, or neither.

   b.) (2) What is the implication of your answer in (a.) for a stationary point of the function?

Menu of formulas and definitions

$$f(y) - f(x) \geq \sum_{i=1}^{n} f_i(x)\,(y_i - x_i)$$

$$z = (1-\lambda)x + \lambda y$$

$$\lambda f(x) + (1-\lambda) f(y) \leq f(\lambda x + (1-\lambda) y)$$

$$\frac{\partial y}{\partial x_i} = -\frac{F_i}{F_y}$$

$$f(y) - f(x) \leq \sum_{i=1}^{n} f_i(x)\,(y_i - x_i)$$

$$\lambda f(x) + (1-\lambda) f(y) \geq f(\lambda x + (1-\lambda) y)$$