Mathematical Economics (2019/2020)

Exercises 2

1. The utility function is given by

A) $u(x_1, x_2) = x_1^2 + x_2^2$; B) $u(x_1, x_2) = x_1^{\frac{1}{3}} + x_2^{\frac{1}{3}}$; C) $u(x_1, x_2) = x_1^n + x_2^n$;

D) $u(x_1, x_2) = \frac{1}{2}\ln x_1 + \frac{1}{4}\ln x_2$; E) $u(x_1, x_2) = x_1^{\frac{1}{n}} + x_2^{\frac{1}{n}}$, $n \neq 0$.

Check the following relationships

a) $\varphi(p, I) = f(p, v(p, I))$ – the Marshallian demand at income I is the same as the Hicksian demand at utility $v = v(p, I)$

b) $f(p, u) = \varphi(p, e(p, u))$ – the Hicksian demand at utility u is the same as the Marshallian demand at income $e(p, u)$

c) $e(p, v(p, I)) = I$ – the minimum expenditure to reach utility $u = v(p, I)$ is I

d) $v(p, e(p, u)) = u$ – the maximum utility from income $e(p, u)$ is u

e) $\frac{\partial \varphi_i(p, I)}{\partial p_j} = \frac{\partial f_i(p, u)}{\partial p_j} - \frac{\partial \varphi_i(p, I)}{\partial I} \cdot \varphi_j(p, I)$, $i, j = 1, 2$ $i \neq j$ – the Slutsky equation

(1.25 p)