Mathematical Economics (2017/2018)

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) $\varphi(p,I)=f\left(p,v(p,I)\right)$ – 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)