GS/ECON 5010   Assignment 1   F2006

due : Wednesday September 27   before class

Do all 5 questions. Each counts 20%.

1. Are the preferences represented by the utility function below strictly monotonic? Convex?

$$u(x_1, x_2, x_3) = \sqrt{(x_1)^2 + x_2 + x_3}$$

Explain briefly.

2. Are the preferences represented by the utility function below strictly monotonic? Convex?

$$u(x_1, x_2) = \frac{x_1 x_2}{x_1 + x_2}$$

Explain briefly. (The above definition holds only if $\mathbf{x} \neq 0$; if $\mathbf{x} = 0$, then define $u(0, 0)$ here as equalling 0.)

3. Calculate a person's Marshallian demand functions, if her preferences can be represented by the utility function

$$u(x_1, x_2, x_3) = \ln x_1 + \ln (x_2 + x_3)$$

4. Calculate a person's Marshallian demand functions, her indirect utility function, and her expenditure function, if her direct utility function is

$$u(x_1, x_2, x_3) = x_1 - \frac{1}{x_2 x_3}$$

when $y^3 > 8 p_1 p_2 p_3$.

5. What is a person's expenditure function, if her preferences could be represented by the utility function

$$u(x_1, x_2) = x_1 - \frac{x_1}{x_2}$$

if $p_2 < y$?