GS/ECON 5010   Assignment 1   F2007

due : Wednesday September 26   before class

Do all 5 questions. Each counts 20%.

1. Are the preferences described below strictly monotonic? Convex? Explain briefly.

There are two goods in the person's consumption bundle. In comparing any 2 bundles, $x = (x_1, x_2)$ and $y = (y_1, y_2)$, she gives points for a bundle which has more of a good. If $x_1 > y_1$, then bundle x gets 1 point; if $y_1 > x_1$ then bundle y gets 1 point ; if $x_1 = y_1$, then each bundle gets half a point. If $x_2 > y_2$, then bundle x gets 2 more points ; if $y_2 > x_2$, then bundle y gets 2 more points ; if $x_2 = y_2$, then each bundle gets 1 point.

(So, for example, if $x = (3, 2)$ and $y = (4, 1)$ then x would get 2 points and y would get 1 point.)

She finds bundle x at least as good as bundle y if and only if x gets at least as many points as y.

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

$$u(x_1, x_2, x_3)) = 10 - \frac{1}{x_1 x_2 x_3 + 1}$$

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

$$u(x_1, x_2) = \min\left(\ln x_1 + 2\ln x_2, 2\ln x_1 + \ln x_2\right)$$

(where "min" means "the minimum of").

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

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

5. Derive the Slutsky matrix (that is , the 2–by–2 matrix of derivatives of Hicksian demands with respect to prices) for a consumer whose preferences can be represented by the direct utility function

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