Consumer and Producer Theory

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EXERCISE 3: Utility Representation

Part 1. Exercises 3.B.2, 3.B.3, 3.C.1, 3.C.2, 3.C.4, 3.C.6; from Mas-Colell. Exercises 2.1, 2.2, 2.4 from Rubinstein

Part 2.

1. Check if preference relations in exercise 1 problem 1 satisfy

- a) strong monotonicity
- b) local non-satiation
- c) convexity
- d) strong convexity

An indifference set through a consumption bundle $z \in X$ is the set $\sim (z) = \{x \in X : z \sim x\}$. For each preference relation in exercise (1) define and (where possible) graph the $\sim (z)$ for some arbitrary z (in a-e you may take the dimension of consumption space n = 2).

2. Show that if u represents \succeq then g(u) still represents \succeq for any strictly increasing $g: \mathbb{R} \to \mathbb{R}$. Show that this is generally not true for non-decreasing g. If u is strictly concave, can you say that w = g(u) is also strictly concave for any strictly increasing g?

3. Suppose a consumer consumes apples and oranges and his total utility of consumption is given by $U(a, o) = u(a) + \frac{1}{2}u(o)$, where u is a function $u : \mathbb{R} \to \mathbb{R}$. Let w be a monotonic g transformation of u and $W(a, o) = w(a) + \frac{1}{2}w(o)$. Do U and W represent the same preferences over the set of consumption bundles? Prove your answer.