

MIDTERM

Suggested Solutions

1. (a) A good is normal (inferior) if the quantity demanded of that good increases (decreases) following an increase in income, other things remaining unchanged. Assuming that the demand for good i is differentiable in income, good i is normal

(inferior) if the partial derivative $\frac{\partial x_i(\underline{p}, w)}{\partial w}$ is positive (negative).

(b) A good is a luxury (necessity) if the income elasticity of its demand is greater (positive but smaller) than 1.

Assuming that the demand for good i is differentiable in income, good i is a luxury

(necessity) if the quantity $\frac{\partial x_i(\underline{p}, w)}{\partial w} \frac{w}{x_i(\underline{p}, w)}$ is greater than 1 (between 0 and 1).

(c) Goods i and j are complements (substitutes) the quantity demanded of one decreases (increases) following an increase in the price of the other, other things remaining unchanged.

Assuming that the demand for each of the goods is differentiable with respect to the price of the other, goods i and j are complements (substitutes) if the cross-partial derivative

$\frac{\partial x_i(\underline{p}, w)}{\partial p_j}$ is negative (positive).

2. See Solutions Set for PS#6/Q12

3. See Solutions Set for PS#6/Q3

4. (TRUE) Consider Walras' Law: $\sum_{i=1}^N p_i z_i(\underline{p}) = 0$ (I)

Let us denote by $F \subset \{1, \dots, N\}$ the index set of the food-type commodities and re-write (I) as follows:

$$\sum_{i \in F} p_i z_i(\underline{p}) + \sum_{j \in N \setminus F} p_j z_j(\underline{p}) = 0 \quad (\text{I.1})$$

We are given that the first term on the LHS of (I.1) is zero. The other term must also be zero, otherwise (I) is violated.