Mathematics Review Course
Summer 2023
Problem Set 10

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Note: [Source] at the start of each problem denotes the source of the question. If there is no source, it is an original problem of my creation.

Kuhn Tucker Conditions

1. Max $U = xy$ s.t. $100 \geq x + y$ and $x \leq 40$.
2. Max $U = xy^2$ s.t. $100 \geq x + y$ and $120 \geq 2x + y$.

Comparative Statics

3. [Uni. Cape Town] Suppose you have found the equilibrium quantity as $Q^* = \frac{ad-bc}{b+d}$. Sign the comparative static changes for the non-negative variables a, b, c, d.
4. [Uni. Cape Town] Suppose you have determined market equilibrium as $Q^* = \frac{\theta(\alpha+\gamma G)-\beta(\delta+\lambda N)}{(\beta+\theta)}$ and $P^* = \frac{\delta+\lambda N+\alpha+\gamma G}{(\beta+\theta)}$. Sign the comparative statics if the substitution good price G changes and if the input price N changes.