

MATHEMATICS FOR ECONOMICS

PROBLEM SET 5

The problems came from Simon and Blume (1994).

Chapter 21: 2, 5, 8, 9, 11, 12, 15

In addition, you are asked to answer the following open question in Note 5

1. Show that $[a,b] \times [a,b] \subset \mathbb{R}^2$ is a convex set.
2. Prove Theorem 5 for H^+ .
3. Use Definition 7 to show that $f(x) = -x^2$ is a concave function on \mathbb{R} .
4. Use Theorem 8 to show that $f(x) = -x^2$ is a concave function on \mathbb{R} .
5. Use Theorem 9 to show that $f(x) = -x^2$ is a concave function on \mathbb{R} .
6. Prove that the upper level sets of $f(x) = -|x|$ are convex sets.
7. Complete Example 2.