

Introduction to Mathematical Modelling
Question List 1.
Convex and star-shaped set

1. What is the definition of a convex set? Draw the examples of a convex and non-convex sets
2. What is a convex combination? Draw example of convex combination of (a) three points; (b) four points.
3. The Radon theorem: general formulation, illustration in \mathbb{R}^2 .
4. Helly's theorem: formulation for finite number of sets, counter-example for infinite number of sets.
5. Compact sets in \mathbb{R}^d : definition and the main properties. Examples of compact and non-compact sets.
6. Internal, external, and boundary points for a set: definitions and examples.
7. Helly's theorem for in finite number of sets.
8. Star-shaped sets: definition, examples, Krasnosel'skii's theorem.