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# Optimization. A first course of mathematics for economists

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## I. Preliminaries

- Topology: Open, closed, compact, bounded sets. Interior and boundary points.
- Continuous real functions.
- Derivatives of real functions. Partial derivatives. Continuous differentiability.

## II. Static optimization

- Optimization in economics.
- Stationary points. Definition and characterization.
- Classical programming.
- Non-linear programming.
- Linear programming.

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## III. Economic Dynamics

- Linear differential equations
- Linear difference equations

## IV. Dynamic optimization

- The optimal control problem
- The principle of optimality
- Bellman equation

# References

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