

# Notes on Newtonian Mechanics

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## I. THE PRINCIPLES OF RELATIVITY AND DETERMINACY

### A. *Space and time*

In Newtonian mechanics, space is three-dimensional and euclidean, and time is one dimensional.

### B. *Galileo's principle of relativity*

- 1) All the laws of nature at all moments of time are the same in all inertial coordinate systems.
- 2) All coordinates systems in uniform rectilinear motion with respect to an inertial one are themselves inertial.

### C. *Newton's principle of determinacy*

The initial state of a mechanical system, the totality of position and velocities of its points at some moment of time, uniquely determines all its motion.