

## Unity of the Sciences

### 1) By Goal:

All (theoretical) sciences seek to ascend from opinion to knowledge, where the latter consists in the knowledge of propositions that are true, universal, necessary, better known, explanatory, and, in the case of their first principles, indemonstrable (logically prior, primitive).

### 2) By Methods:

- a) Induction: The first principles of a science are known by the faculty of intellectual intuition, performing the mental operation of induction, the ascent from the particular and contingent to the universal and necessary. In performing this ascent, the objects of experience are analyzed, by means of the four causes, to discover the ways in which they are the same and different.
- b) Method of Division: systematic presentation of the results of classification of things according to sameness and difference.
- c) Demonstrative Proof (Syllogism): Inferences based on the relations between classes of things.

### 3) By Subordination:

- a) All other sciences use the common axioms of the first science (metaphysics, ontology), e.g., Principle of Non-Contradiction (PNC).
- b) Some sciences are subordinate to others to the extent that they use the principles of that science to explain their own subject matter, e.g., applied mathematics in optics, harmonics, astronomy, and medicine.

## Division of the Sciences

### 1) By Goal:

- a) Theoretical (liberal, non-applied): knowledge is sought for its own sake, as an intrinsic good.
- b) Productive: the end is the production of some good that is useful or instrumentally good, e.g., agriculture for food; medicine for health; engineering for machines, tools, shelter.
- c) Practical: knowledge is pursued in the service of improving some form of activity, most importantly, moral and political life.

### 2) By Subject Matter:

Autonomy of sciences: each science has its own proper subject matter and, thus, proprietary principles.