Chapter 5 Mathematics

5:1a Math and Deduction

Mathematical knowledge claims
- Sound and hard to argue with because they are based on logical deduction
- Different than knowledge in some other areas of knowledge because there is a possibility of proving claims completely
- Are objective claims which anyone who understands math can agree on

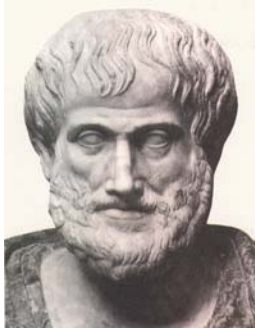$$b = \frac{\sum XY - n\overline{XY}}{\sum X^2 - n(\overline{X})^2}$$

$$a = \overline{Y} - b\overline{X}$$

Logical deduction
- The foundation on which mathematics is built
- Deduction can be defined as: *making conclusions based on premises known to be true*
- Mathematics proves itself through deduction

5:1b Math and Deduction

Logic

- **Logic** is *the science of correct reasoning*
- **Reasoning** is *any argument in which certain assumptions of premises are stated, and then some other conclusion or fact necessarily follows*.
- **Logic sometimes called** *the science of necessary inference*

Math and metaphysics

- The logic behind mathematics is also viewed as being a member of the branch of philosophy known as *metaphysics*
- **Metaphysics** is *the study and the description of the nature of reality*
- Math in the west originated as a branch of philosophy. It attempted to describe and understand the nature of reality

5:1c Math and Deduction

- The assumption that reasoning is the best way at getting to the nature of reality is a philosophical assumption which may not necessarily be true in all or any circumstances

Subjects and Predicates
- A *subject* is considered an individual phenomenon or entity, such as a **tree** or a **bird**.
- A *predicate* is an attribute of the subject, such as the tree being **big** or the bird being **grey**.
- There are agreed upon rules in math regarding the use of subjects and predicates

Fundamental principles regarding subjects and predicates
- ***Identity***: Everything is what it is and acts accordingly