

## Logic: the ‘Art of Thinking’

- (1) All squirrels have four legs.
- (2) All dogs have four legs.
- (3) Therefore, all dogs are squirrels.
  
- (4) If we do not raise taxes, the money runs out.
- (5) We must raise taxes.
- (6) Therefore, the money does not run out.
  
- (7) I can conceive of the most perfect being.
- (8) Therefore the most perfect being exists.

We know a bad argument  
when we see one.  
But why, or how?

From Descartes’s *Discourse on Method* (1637)

‘Good sense is the best distributed thing in the world: for everybody thinks himself so well endowed with it that even those who are the hardest to please in everything else do not usually desire more of it than they possess. In this it is unlikely that everyone is mistaken. It indicates rather that the power of judging well and of distinguishing the true from the false—which is what we properly call ‘good sense’ or ‘reason’—is naturally equal in all men, and consequently that the diversity of our opinions does not arise because some of us are more reasonable than others but solely because we direct our thoughts along different paths and do not attend to the same things. For it is not enough to have a good mind; the main thing is to apply it well.’<sup>1</sup> (AT VI 1–2)

From Arnauld & Nicole, *Logic of the Art of Thinking* (1662)

‘Everywhere we encounter nothing but faulty minds, who have practically no ability to discern the truth. They view everything from the wrong angle; they are satisfied by the worst reasons and want to satisfy others with them. They let themselves be carried away by the slightest appearances; they are always in excess and extremes; they have no grasp for holding firmly to the truths they know because they are attached to them more by chance than solid enlightenment.’<sup>2</sup>  
‘Logic is the art of conducting reason well in knowing things, as much to instruct ourselves about them as to instruct others.’ (*ibid.*)

Some of these thoughts are mirrored in typical modern definitions of formal logic:

- ‘the science of correct reasoning’,<sup>3</sup> or

1 In Cottingham, J., Stoothoff R. & Murdoch D. (Eds.) (1985). *The Philosophical Writings of Descartes, Vol. I* (p. 111). Cambridge: Cambridge University Press.

2 Transl. Buroker, J. V. (1996). Cambridge: Cambridge University Press (p. 5).

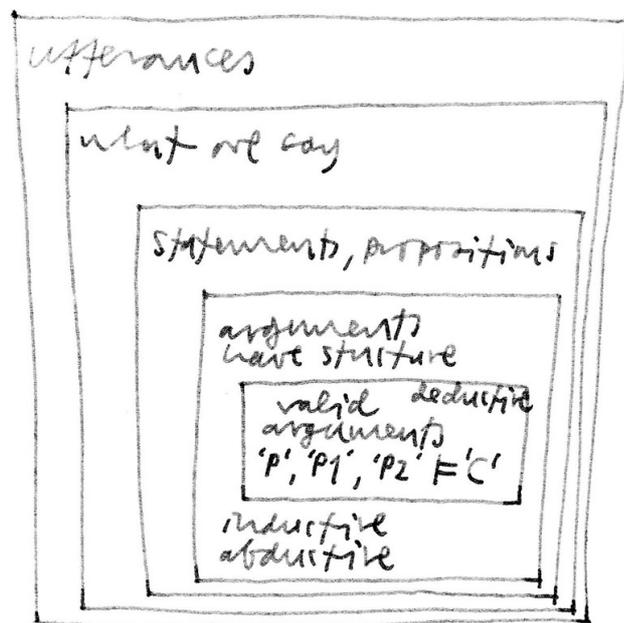
3 Schumm, G. F. (1995). Formal Logic in R. Audi (Ed.), *The Cambridge Dictionary of Philosophy* (p. 274). Cambridge: Cambridge University Press.

- ‘the study of the methods and principles used to distinguish good (correct) from bad) incorrect reasoning’,<sup>4</sup> or
- ‘the study of consistent sets of beliefs’,<sup>5</sup> or
- ‘like ethics, logic can also be called a normative science. How must I think in order to reach the goal, truth?’,<sup>6</sup> or
- ‘a central goal of logic is to study logical truth and logical consequence.’<sup>7</sup>

From Aristotle’s *Prior Analytics*

- ‘First, to state what our enquiry is about or relates to: it is about demonstration, it relates to demonstrative science. Next, we have to define the following: proposition; term; syllogism; ...’ (24a1–3).
- ‘A proposition is a form of words that affirms or denies something of something’ (24a 16).
- ‘What I call a Term is something got by resolving a proposition, namely a predicate or what it is predicated of, with an ‘is’ added on.’ (24b16–7).
- ‘A Syllogism is a form of words in which certain things are assumed and there is something other than what is assumed which necessary follows from things’ being so. By ‘from’ I mean ‘because of’; and ‘follows because of things’ being so’ means that no further proposition is needed to make the ‘following’ necessary’ (24b18–22).

- **Key Points.** (1) logic is a branch of meta-philosophy; (2) proposition = entity that is true or false, or has a truth-value; (3) syllogisms concern logical implication or consequence; (4) syllogisms are deductive arguments.
- Logic studies the validity of deductive arguments. An argument is valid: *if the premises are true, then the conclusion could not be false.* We might say that the conclusion is ‘conclusive’; it requires acceptance.
- Validity concerns the formal connection between the premises and the conclusion. This connection preserves truth (e.g., ‘A’, ‘ $A \supset B \vDash B$ ’).
- Logic is *formal* since it is topic neutral, i.e. not concerned with the content (or ‘matter’) of particular propositions.



4 Copi, I. M. (1972) *Introduction to Logic* (p. 3). New York: Macmillan.

5 Hodges, W. (2001). *Logic* (p. 1). London: Penguin.

6 Frege, G. (1897/1997). *Logic*. In M. Beaney (Ed.) *The Frege Reader* (p. 228). Oxford: Blackwell.

7 Sider, T. (2010). *Logic for Philosophy* (p. 2). Oxford: Oxford University Press.

