1. Recall all the syllogistic terminology.
2. Give some examples of syllogisms valid traditionally and not in first-order logic. Try to identify a pattern.
3. Think of the three 'paradigms' of experimental research in syllogistic reasoning (p. 250). Identify their (*a priori*) weaknesses.
4. What *illicit conversion* consists in? Under what interpretation conversions of A and O sentences would be *licit*?
5. Identify in the Table 1 (p. 251) the following syllogisms: Barbari (I), Celarent (I), Cesare (II), Camestres (II), Festino (II), Darapti (III), Bocardo (III), Camenes (IV).
6. What are 'donkey sentences'? Give some examples.
7. Give a first-order translation for the original 'donkey sentence'. Give a first-order translation for the sentence "If a farmer owns a donkey, he beats it." Explain which quantifiers you chose to translate the indefinite noun phrase and motivate your choice.
8. Give some examples of upward entailing and downward entailing.
9. Create a monotonicity profile for 'most'.
10. What are traditional (Aristotelian, say) justifications for rules: NO/ALL-NOT, ALL/SOME?
11. What 'no inference without interpretation' means?

Additional materials

- Jonathan Sippel and Jakub Szymanik (2018) "Monotonicity and the Complexity of Reasoning with Quantifiers", *Proceedings of the 40th Annual Meeting of the Cognitive Science Society*.
- Marcin Zajenkowski, Jakub Szymanik and Maria Garraffa (2013) "Working Memory Mechanism in Proportional Quantifier Verification", *Journal of Psycholinguistic Research*, Vol. 43(6), pp. 839–853.
- Marcin Zajenkowski and Jakub Szymanik (2013) "MOST intelligent people are accurate and SOME fast people are intelligent. Intelligence, working memory, and semantic processing of quantifiers from a computational perspective", *Intelligence. A Multidisciplinary Journal*, Vol. 41(5), 2013, pp. 456–466.
- Sangeet Khemlani and P. N. Johnson-Laird (2012) "Theories of the Syllogism: A Meta-Analysis", *Psychological Bulletin* , Vol. 138(3), pp. 427–457.
- Mike Oaksford and Nick Chater (2001) "The probabilistic approach to human reasoning", *TRENDS in Cognitive Sciences*, Vol. 5(8), pp. 349–356.

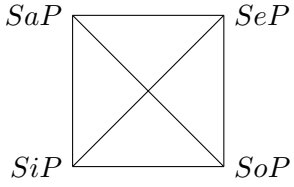
Mnemonics

- P – the major term, predicate in the conclusion
- S – the minor term, subject of the conclusion
- M – the middle term
- a, i, e, o – *AffIrmo, nEgO*
- proof hints:
  - B, C, D, F – first figure valid mood to be used
  - s – s-conversion
  - p – p-conversion
  - m – metathesis (switch of premises)
  - c – *reductio at impossibile*

Sentences

a – universal affirmative, e – universal negative, i – particular positive, o – particular negative

Square of opposition



relationships:

contrariety	SaP – SeP
subcontrariety	SiP – SoP
subalternation	SaP – SiP, SeP – SoP
contradiction	SaP – SoP, SeP – SiP

Conversion, obversion, contraposition

	conversion	obversion	contraposition
SaP	PiS^*	SeP'	$P'aS'$
SeP	PeS^{**}	SaP'	$P'oS'$
SiP	PiS^{**}	SoP'	–
SoP	–	SiP'	$P'oS'$

* p-conversion, ** s-conversion

Syllogistic figures

	Figure I	Figure II	Figure III	Figure IV
major	MP	PM	MP	PM
minor	SM	SM	MS	MS
conclusion	SP	SP	SP	SP

Valid moods (primary)

Barbara, Celarent, Darii, Ferioque prioris
Cesare, Camestres, Festino, Baroco secundae
Tertia Darapti, Disamis, Datisi, Felapton,
Bocardo, Ferison habet. Quarta insuper addit
Bramantip, Camenes, Dimaris, Fesapo, Fresison.