

1. Gersting, 1.1.5 (negation)
2. Gersting, 1.1.7d,e (writing logical statements)
3. (translating English into symbolic logic notation) A certain coin is tossed twice. Let H_1 represent the statement 'the first toss of the coin is heads' and let H_2 represent the statement 'the second toss of the coin is heads'. Translate the following statements about the tosses into symbolic notation.
 - (a) At least one of the tosses is a head.
 - (b) There is at least one tail.
 - (c) Exactly one of the tosses is a head.
 - (d) The two tosses are not both tails.
 - (e) The tosses have the same outcome.
4. Gersting, 1.1.25 (tracing code)
5. Gersting, 1.1.31, p. 18 (exclusive or). As a warmup for this question, do 1.1.17g and 1.1.20e; but these warmups are not to be handed in.
6. [Smullyan] A tiger or a treasure are placed in each of two rooms. The tiger will eat you if released. Your job is to pick one of the rooms. Of course, you prefer the treasure to the tiger.

The two rooms have signs on their doors. Room 1's sign reads 'At least one of these rooms contains a treasure.' Room 2's sign reads 'A tiger is in the other room.' You are told that either both signs are true or both signs are false. Which room should you pick? Explain your reasoning.
7. [Smullyan] This is a bonus question. Three subjects (A, B and C) were all perfect logicians. Each could instantly deduce all consequences of any set of premises. Also, each was aware that each of the others was a perfect logician. The three were shown seven stamps: two red, two yellow, and three green. They were then blindfolded and a stamp was pasted on each of their foreheads; the remaining four stamps were placed in a drawer. When the blindfolds were removed, A was asked 'Do you know one color that you definitely do not have?' A replied 'No'. Then B was asked the same question and replied 'No'. Is it possible from this information to deduce the colour of C's stamp? If so, what is it and give a proof using symbolic notation.

Hint: You will want to use the statement letter 'AR' to represent the statement 'The stamp on A's forehead is red.' (Here we are extending statement letters to include strings of letters.) Similarly, you might want statement 'letters' BR, CR, AY, BY, CY, AG, BG, CG. You will also want to use the statement letter 'ANR' for the statement 'A knows that his stamp is not red'. Similarly BNR, ANY, BNY, ANG, BNG.
8. Reading: Sections 1.1, 1.2, 1.3 and 1.4 (by the due date).