IN-CLASS EXERCISES
(without grade)

EXERCISE 1: Given the sets under (1) and assuming that the universe of the discourse is \( \cup \{ A, B, C, D, E, F, G \} \), list the members of the sets in (2):

(1) \( A = \{ 1, 2, 3, 4 \} \)
    B = \{ a, b, c, d, e, f \}
    C = \{ 1, 2 \}
    D = \{ 1, 3, 4, a, b \}
    E = \{ \{ 1 \}, 2, \{ a, 1 \} \}
    F = \{ 1, c, d \}
    G = \{ d, e, 2, 3 \}

(2) a. \( C \cap D = \)
    b. \( A \cap F = \)
    c. \( A \cap B = \)
    d. \( C' \cap F' = \)
    e. \( E \cap C = \)
    f. \( (C \cup D) - (C \cap D) = \)
    g. \( F \cup C = \)
    h. \( G' \cap C = \)
    i. \( A \cap E = \)
    j. \( (E \cup B) \cup D = \)
    k. \( \wp(C) = \)
EXERCISE 2: Express the natural language sentences in (3) in Propositional Logic, using the propositional key in (4) and the connectives $\neg$, $\land$, $\lor$, $\rightarrow$ and $\leftrightarrow$.

(3)  
  a. There was a party and Claudi went on the excursion.
  b. If Claudi went on the excursion and Simone went on the excursion too, Mat did not win the bet.
  c. There was a party only if Mat won the bet.

(4)  
  Key:
  
  \begin{align*}
    p &= \text{There was a party.} \\
    c &= \text{Claudi went on the excursion.} \\
    s &= \text{Simone went on the excursion.} \\
    m &= \text{Mat won the bet.}
  \end{align*}

EXERCISE 3: Take the statements in (3a,b,c) as true. Does it follow from them that Simone went to the excursion or that she didn’t, or neither? Explain why.