Excercises 1

Excercise 1: Identifying sets
Which of the following are valid sets, and which are not?

(1) a.   {♗, ♕, ♔, ♙, ♖, ♘}
      b.   {Obama, 'Obama', {Obama}}
      c.   {x | x is a multiple of 17}
      d.   {x, sofa, prime, Pizza, 0, Φ, ♘, x}
      e.   {{{{{Φ}}}}}
      f.   {} (also written as ∅)

Excercise 2: Identifying set members and sets
   • What are the members of the following sets?

(2) a.   {x | x is a multiple of 12 below 60}
      b.   {x | x is the set containing all multiples of 12 below 60}
      c.   {vowel, yellow, 'gelb', {vowel, yellow, 'gelb'}, Φ}
      d.   {{{{{Φ}}}}}
      e.   {Bart}
      f.   {Bart, 'Bart', {Bart}}

   • For the set AM = {Angela Merkel}, which of the following is True or False?

(3) a.   Angela Merkel is a member of AM.
      b.   {Angela Merkel} is a member of AM.
      c.   The current Bundeskanzlerin of Germany is a member of AM.

   • What is the set whose only member is {S}?

Excercise 3: List to predicate notation
   • Convert each of the sets in list notation below to predicate notation.

(4) a.   {2, 4, 6, 8, 10}
      b.   {Bart, Lisa, Homer, Marge, Maggie}
      c.   {Leipzig}
      d.   {'Bart', 'Lisa', 'Homer', 'Marge', 'Maggie'}
      e.   {}

Excercise 4: Predicate to list notation
   • Convert each of the sets in predicate notation below to list notation.

(5) a.   {x | x is an odd number less than 12}
      b.   {z | z is the name of the first president of the USA}
      c.   {a | a is a triangular circle}

Excercise 5: Subset superset relations
   • List the (proper) subset or (proper) superset relations that hold between the following
     sets.

(6)   a.   A = { x | x is a Beatles song written by Paul McCartney}

        b.   C = { x | x is a Beatles song written by Ringo Starr}

        c.   D = {Let it be, Maxwell's Silver Hammer, Hey Jude}

        d.   F = { }