80-310/610 Logic and Computation
Exercise Set 6
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Exercise 1 (2.2.1.1.i-iv)

(i) $(2; \_; 1)$;

(ii) $(\_; 2, 2, 1; |N|)$, *where* $|N|$ *can be written as* $\aleph_0$.

(iii) $(2; 2, 2, 1; 1)$;

(iv) $(\_; 2, 2, 2, 1; 5)$.

Exercise 2 (2.3.2)   *Of course the students can choose their own examples for this exercise, so my answers are merely representative.*

1. *Five terms for language (iii):* $\emptyset$, $x \cap \emptyset$, $x \cup y$, $(x \cup y) \cap z$, $(x \cap y) \cup z$. *Strictly speaking, these should all be in prefix notation, as in* $\cap(x, y)$, *but don't worry about it. Even better if the students choose function symbols* g, f *for* $\cap$, $\cup$, *but don't count off for choosing* $\cap$, $\cup$ *as predicate symbols for themselves.*

2. *Five terms for language (viii):* x, $|x|$, x^2, $|x^2|$, $x - y$.

3. *Two atomic formulas for language (vii):* $x = y$, $y = x$.

4. *Two closed atomic sentences for (iii):* $\emptyset \subseteq \emptyset^c$, $\emptyset = \emptyset$.

5. *Two closed atomic sentences for (vi):* $1 = 1$, $\perp$ *(these are the only two possible).*