Chapter 1: Hints and Selected Solutions

Section 1.3 (page 25)

1.4 Here are a few translations:

1. Cube(a)
4. Large(d)
7. Dodec(e)
10. BackOf(d, a)

1.7

	Original	Rotated 90°	Rotated 180°	Rotated 270°
1.	FALSE	FALSE	FALSE	FALSE
2.	FALSE	FALSE	FALSE	FALSE
3.	TRUE	FALSE	FALSE	TRUE
4.	FALSE			
5.	TRUE			
6.	FALSE	FALSE	TRUE	FALSE

Section 1.4 (page 29)

1.8
1. There are eight atomic sentences that can be formed. These include the following: GaveScruffy(max, max),GaveScruffy(max, claire), GaveScruffy(claire, claire), GaveScruffy(claire, max).
2. There are sixty-four. Why?

1.9
1. Owned(claire, folly, 2 : 00)
3. Student(max)
6. $2:00 < 2:05$

1.10 1. *Max owned Scruffy at 2 p.m.*

3. *Max gave Scruffy to Claire at 3:00 p.m.*

1.11 1. Let's use ShookHands(x, y) to say that x shook hands with y at some time or other. Then our sentence would be ShookHands(max, claire).

2. You will need a different predicate than in (1), one that has an argument place for days. You will also need a name for yesterday.

3. Let's use a to name Aids, i for influenza, and LessCont(x, y) to say that x is less contagious than y. Then our sentence would be simply LessCont(a, i).

Section 1.5 (page 34)

1.12

1. *Claire's father is taller than Max's father.*

4. *Max's maternal grandmother is taller than his paternal grandmother.*

1.13

	Leibniz's	Bolzano's	Boole's	Wittgenstein's
1.	TRUE	TRUE		
2.	TRUE			
3.	TRUE			
4.	TRUE			
5.	FALSE			
6.	TRUE	TRUE		
7.	TRUE			
8.	TRUE		FALSE	
9.	TRUE			
10.	TRUE			

1.16 Let fav(x) be x's favorite actor, Better(x, y) mean that x is better than y, and let's use the obvious names.

2. Better(fav(nancy), sean)

4. fav(fav(claire)) = brad

Section 1.7 (page 39)

1.20 2. $\mathsf{1}$ and $\mathsf{0}$ are terms by clause 1. Then $\mathsf{1} \times \mathsf{0}$ is a clause by an application of clause 2, the part dealing with $\times$. Another application of clause 2, the part dealing with $+$, shows that the $(\mathsf{0} + (\mathsf{1} \times \mathsf{0}))$ is a term. The term refers to 0 since $1 \times 0 = 0$ and $0 + 0 = 0$.