**Section 1.8**

**Part One**

Assume:

* + the domain consists of integers
  + O(x) is “x is odd”
  + L(x) is “x < 10”
  + G(x) is “x>9”

What is the truth value of the following statements.

* 1. ∃ x [ O(x) ]
  2. ∀ x [L(x) → O(x) ]
  3. ∀ x [L(x) → ¬ G(x) ]
  4. ∃ x [L(x) ∧ G(x)]
  5. ∀ x [L(x) ∨ G(x)]
  6. ∃ x [ L(x) → G(x) ]

**Part Two**

How would you write these in English? Assume that the domain for x is all humans.

(∀ x) [ GoesToUNI(x) → Smart(x) ]

(∀ x) [ GoesToUNI(x) ∧ Smart(x) ]

(∃ x) [ GoesToIowa(x) → Smart(x) ]

(∃ x) [ GoesToIowa(x) ∧ Smart(x) ]

**Part Three**

How do you write the negation of:

* All Americans eat cheeseburgers
* There is a smart student at the University of Iowa.

**Part Four**

How do you write the negation of:

* ∀ real numbers x, if x2 >= 1 then x> 0
* For every student at UNI if they have been at UNI for at least two years then they are classified as a Junior.
* There exists an employee at UNI who was born in Ames and graduated from Harvard.

**Part Five**

As a group, discuss these problems and come up with a predicate statement to represent what is written in English.

