Problem Set #3
Due: Beginning of class, Thursday, August 2nd

1. (15 points) Unification
For each of the following pairs of expressions, give the most general unifier (if it exists) or say that the expressions are not unifiable. The lower case letters f and g denote function constants, all other lower case letters denote variables, and upper case letters (except for P, which is a predicate) denote object constants.

   a.  P(x, B, B) and P(A, y, z)
   b.  P(g(f(y)), g(u)) and P(x, x)
   c.  P(x, f(x)) and P(y, y)
   d.  P(y, y, B) and P(z, x, z)
   e.  P(y, g(A, B)) and P(g(x, x), y)

2. (24 points) Clausal Form
Problem 16.3 in Nilsson textbook, p. 266.

3. (22 points) Resolution in First-Order Predicate Calculus
Problem 16.7 in Nilsson textbook, p. 266.

4. (39 points) STRIPS Planning
Problem 22.6 in Nilsson textbook, p. 401-402.

A few clarifications and hints regarding this problem:
- The robot begins at the base camp, B.
- The preconditions, delete lists, and add lists of the four actions the robot can take may all be defined using just the five predicates (AtRobot, At, Carrying, Fueled, and CanGo) given in the problem. You do not need to define any additional predicates.
- For the solution plan, you can assume that STRIPS performs a “good” heuristic search when generating a plan, so you can assume the plan is as short as possible to get the robot to the goal.