**Homework 2**

1. Sec.1.4: 20, 24, 26.

2. Sec. 1.5: 4

3. Prove that $p \to (q \wedge r) \equiv (p \to q) \wedge (p \to r)$ using identities or truth tables. Then use this equivalence and the rules of inference to show the following premises

$$q \to (u \wedge t), u \to p, (p \wedge t) \to (r \vee s), \neg s$$

   imply the conclusion $q \to r$.

4. Let $S(x)$ = "$x$ is in this class", $R(y)$ = "$y$ owns a red convertible, $T(z)$ = "$z$ has gotten a speeding ticket".

   a. For each of the statements below, please translate them into propositions using $S(x), R(y)$ and $T(z)$ with quantifiers.

   (i) Linda, a student in this class, owns a red convertible.

   (ii) Everyone who owns a red convertible has gotten at least one speeding ticket.

   (iii) Therefore, someone in this class has gotten a speeding ticket.

   b. Next, using the rules of inference, show why statement (iii) follows from statements (i) and (ii).

5. Sec. 1.5: 16.