CSCI 241H:
HOMEWORK 2

Show your work.

1. Write the following in predicate logic. Don't forget the quantifiers; explain what each predicate means.

   (a) Every student who takes 241 either comes to class regularly, or borrows the notes from someone who comes to class regularly.

   (b) There is no one in the world who is loved by everybody.

   (c) There is such a man in this group that no one is taller than he is.

2. Show that

$$\forall x P(x) \vee \forall x Q(x) \neq \forall x (P(x) \vee Q(x))$$

3. Are the following two expressions equivalent? Argue.

$$\forall x (P(x) \rightarrow Q(x))$$

   and

$$(\forall x P(x)) \rightarrow (\forall x Q(x))$$

4. Page 80, question 35 from your book:

   If Superman were able an willing to prevent evil, he would do so. If Superman were unable to prevent evil, he would be impotent; if he were unwilling to prevent evil, he woul be malevolent. Superman does not prevent evil. If Superman exists, he is neither impotent nor malevolent. Therefore, Superman does not exist.