homework 5

cs201.1 **due 10 february 1999**

real problems

1. Prove $A \cup (B - A) = A \cup B$.

2. Prove or disprove the following statements. (Hint: one of them is false. To disprove it, give an example of sets that make it untrue.)

a) $P(A) \cup P(B) = P(A \cup B)$

b) $P(A) \cap P(B) = P(A \cap B)$

3. Prove that if f and g are both one-to-one, then $f \circ g$ is also one-to-one.

4. A function (from R to R) is called *strictly increasing* if and only if $x < y$ implies that $f(x) < f(y)$.

a) Give an example of a strictly increasing function. Draw its graph.

b) Prove that if a function is strictly increasing, then it's one-to-one.

extra credit

Sometimes we want to talk about all the functions from A to B. We call the set of all such possible functions $MAP(A, B)$. If A has a elements and B has b elements, how many elements are in $MAP(A, B)$? How many of the elements of $MAP(A, B)$ are one-to-one correspondences?