University of Washington
Department of Computer Science and Engineering
CSE 321, Winter 2008

January 22, 2008

Homework 3, Due Wednesday, January 30, 2008

Problem 1:
Section 1.5 Problem 16 (Fifth edition, Section 1.5, Problem 12).

Problem 2:
Use rules of inference to show that if $\forall x(P(x) \vee Q(x))$ and $\forall x((\neg P(x) \wedge Q(x)) \rightarrow R(x))$ are true, then $\forall x(\neg R(x) \rightarrow P(x))$ is also true, where the domains of all quantifiers are the same.

Problem 3:
Use a direct proof to show that the product of two odd numbers is an odd number.

Problem 4:
Show that if you pick three socks from a drawer containing just blue socks and black socks, you must get either a pair of blue socks or a pair of black socks.

Problem 5:
Prove or disprove that you can use standard dominoes to tile a regular chess board with all four corners removed.

Problem 6:
Section 2.2, Problem 16 a, e. (Fifth edition, Section 1.7, Problem12 a, e)

Problem 7:
Let $Q(A, B)$ be the proposition $A \subseteq B$. If the universe of discourse for both A and B is all sets of integers, what are the truth values of the following? Justify your answers.

(a) $\exists A \forall B\ Q(A, B)$

(b) $\exists B \forall A\ Q(A, B)$

Problem 8:
Section 2.2, Problem 40. (Fifth edition, Section 1.7, Problem 32)

Extra Credit 9:
Prove or disprove: A 10×10 chessboard can be tiled with 1×4 tiles.

Extra Credit 10:
Describe a winning Chomp! strategy for the first player when starting with an $n \times 2$ grid.