22c:181 Spring 2006
Homework #1 Solution

1. Show by providing truth table

α	β	γ	$\alpha \vee \beta$	$\neg\alpha \vee \gamma$	$\beta \vee \gamma$	$((\alpha \vee \beta) \wedge (\neg\alpha \vee \gamma)) \Rightarrow \beta \vee \gamma$
T	T	T	T	T	T	T
T	T	F	T	F	T	T
T	F	T	T	T	T	T
T	F	F	T	F	F	T
F	T	T	T	T	T	T
F	T	F	T	T	T	T
F	F	T	F	T	T	T
F	F	F	F	T	F	T

2. Show equivalent expressions and truth tables

P	$\neg P$	P**nand**P
T	F	F
F	T	T

P	Q	$P \wedge Q$	$(P$**nand**$Q)$**nand**$(P$**nand**$Q)$
T	T	T	T
T	F	F	F
F	T	F	F
F	F	F	F

P	Q	$P \vee Q$	$(P$**nand**$P)$**nand**$(Q$**nand**$Q)$
T	T	T	T
T	F	T	T
F	T	T	T
F	F	F	F

3. Show an assignment of variables which contradicts associativity,
i.e. x = T, y = T, z = F
(T **nand** T) **nand** F = F **nand** F = T
T **nand** (T **nand** F) = T **nand** T = F

4. The assertion is not valid. An assignment of X = 0, Y = 0 will satisfy the precondition, but not the postcondition.