CSci 1302 Assignment 7

Due Friday, March 9th in class

Problem 1 (16 points). Prove the following arguments. The domain for all problems is $\mathbb{Z}$ - the set of all integers.

A.
1. $\forall x.\forall y.(x > y) \vee (y > x) \vee (x = y)$
2. $\tilde{}(5 > 5)$

$\therefore 5 = 5$

B.
1. $\forall x.\exists y.even(x) \rightarrow y + y = x$
2. $\tilde{}\exists z.z + z = 5$

$\tilde{}even(5)$

C.
1. $\forall x.\forall y.isPrime(x) \leftrightarrow (isDivisible(x, y) \rightarrow (y = 1 \vee y = x))$
2. $isDivisible(9, 3)$
3. $3 \neq 1 \wedge 3 \neq 9$

$\therefore \tilde{}isPrime(9)$

D.
1. $\forall x.odd(x) \leftrightarrow (\tilde{}\exists y.x = 2 \cdot y)$

   $4 = 2 \cdot 2$

$\therefore \tilde{}odd(4)$