

**MATH 302 Discrete Mathematics**  
**Assignment 1.      Due on Wednesday, February 04, 2009**

---

**Read:** Sections 1.1–1.3

**Problems to be graded:**

§1.1 Page 16: 24.

§1.2 Page 28: 18, 22, 30.

§1.3 Page 46: 42, 44, 46.

In addition, do

1. Use a truth table to verify the second De Morgan law

$$\neg(p \vee q) \equiv \neg p \wedge \neg q.$$

2. Simplify the proposition

$$(p \vee q) \wedge \neg(\neg p \wedge q).$$

3. DEFINITION: We call  $n$  even if there exists an integer  $k$  such that  $n = 2k$ . We call  $n$  odd if there exists an integer  $s$  where  $n = 2s + 1$ .

THEOREM: If  $n$  is an odd integer, then  $n^2 + 1$  is an even integer.

- (a) Express the definition of *even*, *odd*, and the above theorem **symbolically** with quantifiers. The domain for  $n, k$  and  $s$  is the set of integers.
- (b) State the converse of the theorem.
- (c) State the negation of the theorem in proper English.

**Practice problems:**

§1.1 Page 16: 3, 4, 9, 10, 14, 18, 30.

§1.2 Page 28: 5, 8, 12, 34, 54.

§1.3 Page 46: 6, 11, 13, 14, 23, 33, 34, 41, 47.

**Note:** You only need to hand-in all the “problems to be graded”.