

**MATH 302 Discrete Mathematics**  
**Assignment 5.**      Due on Wednesday, October 14, 2009

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**Read:** Sections 2.1–2.3

**Definition:** Write down the definitions for the following terms. [5 points]

**the difference of  $A$  and  $B$ , where  $A$  and  $B$  are sets**

**a function from  $A$  to  $B$**

**a function is *one-to-one***

**a function is *onto***

**inverse image of  $S$  (where  $S$  is a subset of the codomain of  $f$ )**

(see page 147)

**Problems to be graded:** [10 points]

§2.2/ 14, 17, 20, 26,

§2.3/ 18, 30, 31, 34, 40.

**Additional problem.** What is wrong with this “proof”?

Theorem. If  $n$  is an integer and  $n^2$  is even, then  $n$  is even.

Proof. Prove by contradiction. Assume that  $n$  is an integer,  $n^2$  is even but  $n$  is not even. That is,  $n$  is odd. But this is impossible, for example, let  $n = 5$  which is an odd integer. Then  $n^2 = 25$ , which is also odd. This counterexample proves the theorem.

**Practice problems:**

§2.2/16, 19, 29, 30, 35, 45, 46.

§2.3/ 1, 2, 5, 8, 10, 12, 15, 19, 36, 39.