

**MATH 302 Discrete Mathematics**  
**Assignment 5.**                      **Due on Wednesday, Feb 29, 2012**  
**6th edition of the textbook**

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**Read:** Sections 2.3, 2.4.

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

a function from  $A$  to  $B$

a function is *one-to-one*

a function is *onto*

the set  $A$  and  $B$  have the same cardinality

countable

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

§2.3/ 15, 18, 30, 31, 34, 40.

§2.4/ 14, 17

**Also do the following problems:**

Let  $g$  be a function from the set  $A$  to the set  $B$  and let  $f$  be a function from the set  $B$  to the set  $C$ . Let  $h$  be composition of  $f$  and  $g$ , i.e.,  $h = f \circ g$ .

1. Prove that if  $h$  is one-to-one, then  $g$  must be one-to-one.  
Give an example to show that  $f$  is not necessarily one-to-one.
2. Prove that if  $h$  is onto, then  $f$  is onto.  
Give an example to show that  $g$  is not necessarily onto.

**Practice problems:**

§2.3/ 1, 2, 5, 8, 10, 12, 19, 36, 38, 39.

§2.4/ 2, 3, 4, 7, 9, 10, 13, 15, 18