

**MATH 113: DISCRETE STRUCTURES**  
**READING QUESTIONS FOR WEDNESDAY WEEK 3**

**Reading assignment.** *Functions* reading posted on the course website.

*Problem 1.* Let  $f : A \rightarrow B$ ,  $g : B \rightarrow C$ , and  $h : C \rightarrow D$  be functions. Prove that  $h \circ (g \circ f) = (h \circ g) \circ f$ .

*Problem 2.* Find an example of an injective function  $f : \mathbb{N} \rightarrow \mathbb{N}$  which is not surjective. Also find an example of a surjective function  $g : \mathbb{N} \rightarrow \mathbb{N}$  which is not injective.

*Problem 3.* Determine appropriate domains and codomains for the square root and squaring functions such that these functions are inverses of each other. (Your sets should be the largest subsets of  $\mathbb{R}$  satisfying this property.)