

Assignment #7

Due 5/17/06

Reading

- Chapters 10 and 11.

Part I

- A. Pages 113–114, Exercises 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7.

Part II

- B. Page 118, Problems 18, 20.

- C. For each of the functions below, answer the following questions. Prove your answers correct.

- Is the function injective?
- Is the function surjective?
- If the function is not surjective, what is its image?

- (a) $f: \mathbb{R} \rightarrow \mathbb{R}$, defined by

$$f(x) = x^2 - 4x + 5.$$

- (b) $g: \mathbb{R} - \{-1\} \rightarrow \mathbb{R}$, defined by

$$g(x) = \frac{x+3}{x+1}.$$

- (c) $h: \mathbb{R}^+ \rightarrow \mathbb{R}$, defined by

$$h(x) = \begin{cases} \frac{1-x}{x}, & \text{if } 0 < x \leq 1, \\ 1-x, & \text{if } x \geq 1. \end{cases}$$