

**Assignment #5***Due — TBA*

1. Regarding our in-class modification of Example 1.4.9: Show without using Calculus that the function

$$f(x) = \frac{x}{\sqrt{1-x^2}} \quad (-1 < x < 1)$$

takes the interval  $[0, 1)$  one-to-one onto  $[0, \infty)$ .

2. Using Calculus, show that the function  $f$  of Problem #1 maps the interval  $(-1, 1)$  onto  $\mathbb{R}$ . Sketch the graph of the function, showing all essential features.
3. Something is wrong with the graph on page 24. What is it? What should the graph look like? Does the function given there still take  $(-1, 1)$  one-to-one onto  $\mathbb{R}$ ? OK to reason from the corrected graph you draw.
4. Suppose  $r$  is a rational number. Prove that the representation of  $r$  as  $p/q$ , where  $p$  and  $q$  are integers with no common factor, is unique (this was an essential part of the proof of Theorem 1.4.11).
5. Exercise 1.4.9