

Honors Math A

Homework 7

A

Read pp. 142-154 in Apostol.

B

To turn in, do the following problems in Apostol: pp. 139-140 exercise 33 (don't forget part c on p. 140) and p. 142 exercises 11, 12, and 19 (don't use l'Hôpital's rule, since we don't even know what a derivative is yet!).

To do for yourself, do p. 139 exercise 28 and p. 145 exercises 1, 3, and 6.

C

1. To turn in:

- a) Give an example, with proof, of a function $f : \mathbf{R} \rightarrow \mathbf{R}$ which is monotonic but not continuous.
- b) Prove that a monotonic surjective function $f : \mathbf{R} \rightarrow \mathbf{R}$ must be continuous.

2. To turn in: If $f, g : [a, b] \rightarrow \mathbf{R}$ are both continuous functions such that $f(x) = g(x)$ whenever x is rational, prove that $f = g$.