

Homework 12 - Math 431

Due Apr 11th

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Office	319 Gross Hall
Office hours	2:45pm on Friday in 304B Gross Hall
Web page	www.math.duke.edu/~mauro/teaching.html

Problems:

§5.3: #5 [10 pts]

§5.6: #6 [15 pts], 7 [20 pts], 15(*)

§5.7: #4 [15 pts], 5 [20 pts].

Additional Problem: [20 pts]. For $y > 0$ consider the iteration

$$x_{n+1} = \frac{1}{2} \left(x_n + \frac{y}{x_n} \right), \text{ for } n \geq 0, x_0 \text{ given.}$$

Using the contraction mapping Theorem, find an infinite interval I such that if $x_0 \in I$, then $x_n \rightarrow \sqrt{y}$ as $n \rightarrow +\infty$. Can you estimate $|x_n - y|$?