

# MATHEMATICS 3210-2. Homework 7.

October 2, 2000

1. Problem # 1, page 47 from the textbook:  
Show that the sequence

$$x_n = \frac{(n^2 + 20n + 35) \sin(n^3)}{n^2 + n + 1}$$

contains a convergent subsequence.

2. Problem # 6, page 47, from the textbook:  
Define a sequence  $(x_n)$  inductively by starting with  $x_1 \geq 2$  and taking  $x_{n+1} = 1 + \sqrt{x_n - 1}$ . Show that  $x_n \downarrow 2$ .

What happens if you start with  $1 \leq x_1 < 2$ ? (Does the sequence converge monotonically to a limit and if it does, what this limit is?)