

Mathematics 3790H – Analysis I: Introduction to analysis
TRENT UNIVERSITY, Winter 2012

Assignment #9

Find the sum one more time!

Due on Thursday, 22 March, 2012.

For this assignment you should brush up on the definition of Taylor series, if necessary.

Consider the series $\sum_{n=0}^{\infty} \frac{(-1)^n}{2n+1} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \dots$.

1. Determine whether this series converges absolutely or conditionally. [3]

2. Show that $\sum_{n=0}^{\infty} \frac{(-1)^n}{2n+1} = \frac{\pi}{4}$. [7]

HINT: There is a well-known (well, reasonably well-known :-) function $f(x)$ such that $f(1) = \frac{\pi}{4}$. Find its Taylor series.