Problem set 7: Series, definition of continuity

Math 521 Section 001, UW-Madison, Spring 2024

March 11, 2024

Please solve the following problems in a clear, complete, and concise manner. You are welcome to work together, but your write-up must be your own. Use of outside internet resources is prohibited.

Due on paper at the beginning of class on **Wednesday, March 20th**. Please be sure to staple your writeup.

1. Give a direct proof (without using Theorems 3.41-43) of the *alternating series test:* suppose that b_n is a sequence of nonnegative reals with $b_n \geq b_{n+1}$ for all $n \in \mathbb{N}$, and let $a_n = (-1)^n b_n$. Then $\sum a_n$ converges iff $b_n \to 0$.

2. Rudin 3.6-8, 11

3. Rudin 4.1-4.