

Group: _____

Name: _____

Math 351 - Elementary Topology

Wednesday, September 19 ** *Sequences in the cofinite topology*

The problems below concern sequences in \mathbb{R} equipped with the **cofinite** topology. Make sure to justify all of your answers.

1. Show that if $\{x_n\}$ is a sequence in \mathbb{R} *with no repeated terms*, then $\{x_n\}$ converges to **every real number**.
2. Consider the constant sequence $x_n = 0 \forall n$. Show this converges only to 0.
3. Consider the alternating sequence $x_n = (-1)^n$. Does this converge? If so, to what?
4. Consider the sequence $1, 1, 2, 1, 3, 1, 4, 1, 5, 1, \dots$. Does this converge? If so, to what?

Write your answer(s) on the rest of this sheet (and back).
