Good Morning, Colleagues
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- Cantor’s diagonalization proof:
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- Cantor’s diagonalization proof: “Had to think about it for a few minutes…”
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• Cantor’s diagonalization proof: “Had to think about it for a few minutes...”

• Is $|\mathbb{R}| = \aleph_1$?
Good Morning, Colleagues

Are there any questions?

- Cantor’s diagonalization proof: “Had to think about it for a few minutes. . .”
- Is $|\mathbb{R}| = \aleph_1$? unresolved
Logistics

- Midterm 1, a week from today
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  - Handwritten notes allowed
  - No book, nothing printed, nothing electronic
  - Be on time!
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- 2 modules due Thursday after exam
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- 2 modules due Thursday after exam
  - First is mainly definitions - may want to do it this week
Cantor-Bernstein-Schröder Theorem

- If $A$ and $B$ are sets with $|A| \leq |B|$ and $|B| \leq |A|$, then $|A| = |B|$.
Activity

1. Try to prove that XXXXXX (3 minutes)
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2. Sponge: $XXXXXXXX$
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2. Sponge: XXXXXXXX

3. Go find someone not sitting near you who doesn’t look like you and compare progress.
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4. Agree on who’s closer or has a nicer solution (3 minutes)
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5. Join with another pair
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6. The other person explain the better progress to the other pair (2 minutes each)
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2. Sponge: XXXXXXXX

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7. Report out (time permitting)
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1. Use C-B-S to prove that $|[0, 1)| = |(0, 1)|$ (3 minutes)
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A Bijection That Works

\[ f(x) = \begin{cases} 
  1/2 & \text{if } x = 0 \\
  x/(1 + x) & \text{if } \exists n \in \mathbb{N}[x = 1/n] \\
  x & \text{otherwise}
\end{cases} \]