CPSC 421/501   Sept 17, 2020

Topics for today or soon:

Section 4 of handout:

  − Countable Sets , Uncountable Sets

  − Cantor's Thm

Sections 5 and 6

− Russell's Paradox and Set Theory Subtleties

− Related Paradoxes and Theorems

BREAKOUT ROOM PROBLEMS

① Show that $\mathbb{N} \times \mathbb{N}$ is countable.

② Show that $\mathbb{Z} \times \mathbb{Z}$ is countable.

③ Let $f : [4] \to \text{Power}([4])$

(where $[4] = \{1,2,3,4\}$) be given by:

$f(1) = \emptyset$, $f(2) = \{1,2\}$, $f(3) = \{2,4\}$, $f(4) = [4]$,

Describe $T = \{ s \in [4] \mid s \notin f(s) \}$.

Convince yourself that T is not in the image of f.   [This is not a precise task.]

④ Is Power$(\{a,b\}^*) \cup \mathbb{N}$ countable ?

⑤ Find an example of an injective and/or surjective and/or bijective map to help you remember these term.
[This is not a precise question.]