

1. Are the sets

- a) all bit strings not containing 0
- b) positive rational #'s with denominator ≥ 4
- c) real numbers not containing 0 in their decimal representation
- d) integers divisible by 5 but not 7

countable or uncountable?

2. Give examples of uncountable sets A and B such that $A \cap B$ is

- a) finite
- b) countably infinite
- c) uncountable.

3. Show that if $A \subseteq B$, and A is uncountable, B is uncountable.

4. Show that there is no infinite set A such that $|A| < |\mathbb{Z}|$.

5. Show that the set of all finite bit strings is countable.

6. Show that there is no one to one correspondence between $\mathbb{Z}$ and $P(\mathbb{Z})$.