Reading Quiz Section 8.2

1. A set A is *uncountable* if and only if _____.

   (a) There is a bijection between A and $[0,1]$.

   (b) There is a surjection from $\mathbb{R}$ onto A.

   (c) There is an injection from $\mathbb{N}$ into A.

   (d) There exists no injection from A into $\mathbb{N}$.

2. Which of the following sets are uncountable. Select all that apply.

   (a) $(1,2] \cup \{3\}$

   (b) $\mathbb{N} \times [1,2]$

   (c) $\mathbb{R} \setminus \left\{ \frac{1}{n} : n \in \mathbb{N} \right\}$

   (d) $\mathbb{Q} \cap [1,2]$

3. True or False: there is no set A such that there is a surjection from $\mathcal{P}(A)$ onto A.

Practice Problems Section 8.2

1. Describe explicit injections $f : (0,1) \to B$ and $g : B \to (0,1)$ where

   $$B = [1,2) \cup \{\pi\} \cup (4\sqrt{2}, 497]$$

   Now explain why $|B| = \mathfrak{c}$.