

Reading Questions 8

page 88 Example 24

page 88 Example 25

1. A one-to-one correspondence is a relation.
2. There is a one-to-one correspondence between the sets $\{a, b, x\}$ and $\{1, 2, 3, 4\}$
3. The sets $\{x \in \mathbb{R} \mid x^2 + 1 = 0\}$ and $\{\}$ have the same cardinality.
4. What is the set $2\mathbb{Z}$?

Section 3.3 One-to-One Correspondence and the Cardinality of Sets (Part 1)

One-to-One Correspondence

P 1. Is there a one-to-one correspondence from $\{1, 2, 3, \dots, n\}$ to the empty set? Is the set finite or infinite?

P 2. Show that the set $\{x, y, z, 1\}$ is a finite set.

Countable Sets

P 3. Show that the set $\mathbb{N} \cup \{0\}$ is a countable set.

P 4. Determine if the set $\{3^n \mid n \in \mathbb{Z}\}$ is countable.

P 5. It is true that every infinite set contains a countable set. Use this fact to prove the following theorem.

Theorem: Let S be an infinite set and let x be an element not in S . Prove that $|S| = |S \cup \{x\}|$.