

Discrete HW1 Nguyen

Khoi Nguyen Do

January 2025

1 Chapter 1.1

1.1 Question 11

11. Every positive number has a positive square root.
- a. All positive numbers **has a positive square root**.
 - b. For any positive number e , there is **a positive square root** for e .
 - c. For all positive numbers e , there is a positive number r such that **r is the positive square root of e** .

1.2 Question 13

13. There is a real number whose product with every real number equals zero.
- a. Some **real number** has the property that its **product with every real number equals zero**.
 - b. There is a real number a such that the product of a **with every real number equals zero**.
 - c. There is a real number a with the property that for every real number b , **the product of a and b equals zero**.

2 Chapter 1.2

2.1 Question 4

- 4.
- a. Is $2 \in \{2\}$? **Yes**
 - b. How many elements are in the set $\{2, 2, 2, 2\}$? **One element**
 - c. How many elements are in the set $\{0, \{0\}\}$? **Two elements**
 - d. Is $\{0\} \in \{\{0\}, \{1\}\}$? **Yes**
 - e. Is $0 \in \{\{0\}, \{1\}\}$? **No**

2.2 Question 9

- 9.
- a. Is $3 \in \{1, 2, 3\}$? **Yes**
 - b. Is $1 \subseteq \{1\}$? **No**
 - c. Is $\{2\} \in \{1, 2\}$? **No**
 - d. Is $\{3\} \in \{1, \{2\}, \{3\}\}$? **Yes**
 - e. Is $1 \in \{1\}$? **Yes**
 - f. Is $\{2\} \subseteq \{1, \{2\}, \{3\}\}$? **Yes**
 - g. Is $\{1\} \subseteq \{1, 2\}$? **Yes**
 - h. Is $1 \in \{\{1\}, 2\}$? **No**
 - i. Is $\{1\} \subseteq \{1, \{2\}\}$? **Yes**
 - j. Is $\{1\} \subseteq \{1\}$? **Yes**

2.3 Question 12

12. Let $S = \{2, 4, 6\}$ and $T = \{1, 3, 5\}$. Use the set-roster notation to write each of the following sets, and indicate the number of elements that are in each set:
- a. $S \times T$
 $S \times T = \{(2, 1), (2, 3), (2, 5), (4, 1), (4, 3), (4, 5), (6, 1), (6, 3), (6, 5)\}$
Number of elements: 9
 - b. $T \times S$
 $T \times S = \{(1, 2), (1, 4), (1, 6), (3, 2), (3, 4), (3, 6), (5, 2), (5, 4), (5, 6)\}$
Number of elements: 9
 - c. $S \times S$
 $S \times S = \{(2, 2), (2, 4), (2, 6), (4, 2), (4, 4), (4, 6), (6, 2), (6, 4), (6, 6)\}$
Number of elements: 9
 - d. $T \times T$
 $T \times T = \{(1, 1), (1, 3), (1, 5), (3, 1), (3, 3), (3, 5), (5, 1), (5, 3), (5, 5)\}$
Number of elements: 9