

## CHAPTER 7

Prove the following statements.

*Exercise (12).* There exists a positive real number  $x$  for which  $x^2 < \sqrt{x}$ .

*Proof:* Write your answer here.

□

*Exercise (18).* There is a set  $X$  for which  $\mathbb{N} \in X$  and  $\mathbb{N} \subseteq X$ .

*Proof:* Write your answer here.

□

*Exercise (21).* Every real solution of  $x^3 + x + 3 = 0$  is irrational.

*Proof:* Write your answer here.

□

*Exercise (31).* If  $n \in \mathbb{Z}$ , then  $\gcd(n, n+1) = 1$ .

*Proof:* Write your answer here.

□

*Exercise (35).* Suppose  $a, b \in \mathbb{N}$ . Then  $a = \gcd(a, b)$  if and only if  $a \mid b$ .

*Proof:* Write your answer here.

□

## CHAPTER 8

Use the methods introduced in this chapter to prove the following statements.

*Exercise (4).* If  $m, n \in \mathbb{Z}$ , then  $\{x \in \mathbb{Z} : mn \mid x\} \subseteq (\{x \in \mathbb{Z} : m \mid x\} \cap \{x \in \mathbb{Z} : n \mid x\})$ .

*Proof:* Write your answer here.

□

*Exercise (6).* Suppose  $A, B$  and  $C$  are sets. Prove that if  $A \subseteq B$ , then  $A - C \subseteq B - C$ .

*Proof:* Write your answer here.

□

*Exercise (7).* Suppose  $A, B$  and  $C$  are sets. If  $B \subseteq C$ , then  $A \times B \subseteq A \times C$ .

*Proof:* Write your answer here.

□

*Exercise (9).* If  $A, B$  and  $C$  are sets, then  $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ .

*Proof:* Write your answer here.

□

*Exercise (10).* If  $A$  and  $B$  are sets in a universal set  $U$ , then  $\overline{A \cap B} = \overline{A} \cup \overline{B}$ .

*Proof:* Write your answer here.

□

*Exercise (14).* If  $A, B$  and  $C$  are sets, then  $(A \cup B) - C = (A - C) \cup (B - C)$ .

*Proof:* Write your answer here.

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*Exercise (Reflection Problem).*      • How long did it take you to complete each problem?  
What part of the assignment took the most time? Why?

*Response:* Write your answer here.

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- What was easy for you? Why do you think that was so?

*Response:* Write your answer here.

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- What was challenging for you? What made it challenging?

*Response:* Write your answer here.

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- Compare your answers to the odd numbered exercises to those in the back of the textbook. What did you learn from this comparison?

*Response:* Write your answer here.

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