1

Sets

(2012 – 2013 Academic Year: Tutorial Questions)

Sets

2.1. **(i)** $A \cup B = \{1, 2, 3, 4, 5, 9\}$; **(ii)** $A \cap B = \{1, 3\}$; **(iii)** $A \setminus B = \{2, 4\}$; **(iv)** $B \setminus A = \{5, 9\}$; **(v)** $\bar{A} = \{5, 9\}$, and $\bar{B} = \{2, 4\}$

2.2. **(i)** $A \cup B = \{0, 1, 2, 3, 5, 6, 9\}$; **(ii)** $A \cap B = \{5\}$; **(iii)** $A \setminus B = \{0, 2, 6\}$; **(iv)** $B \setminus A = \{1, 3, 9\}$

2.3. **(i)** For example see the top part of Fig. 1.1; **(ii)** see Fig. 1.2 with A interchanged for B.

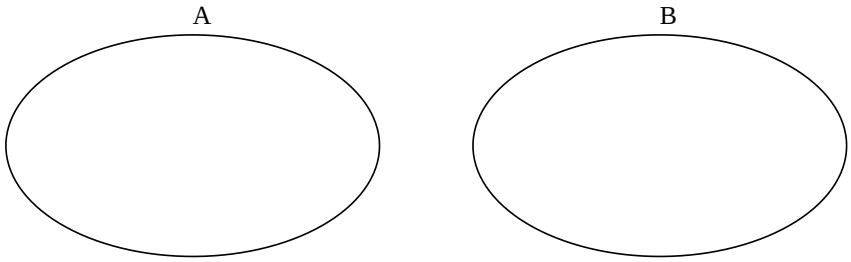

Figure 1.1 A Venn diagram illustrating two sets A and B where (top) $A \cap B = \emptyset$. The universal set has been suppressed here.

2.4. $A \cup B = \mathbb{R}$

2.5. $A \cup B = \mathbb{R}$

2.6. $A \cap B = 1, 2, 3, 4, 5$

2.7. $A \cap B = \emptyset$

2.8. $A \cup B \cap C = \mathbb{R}^+$

2.9. $A \cup B \cap \overline{C} = \{\mathbb{C} \notin \mathbb{R}^+\}$

2.10. $\Omega_{\text{Decimal}} = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$

2.11. $\{\text{red}, \text{green}, \text{blue}\}$

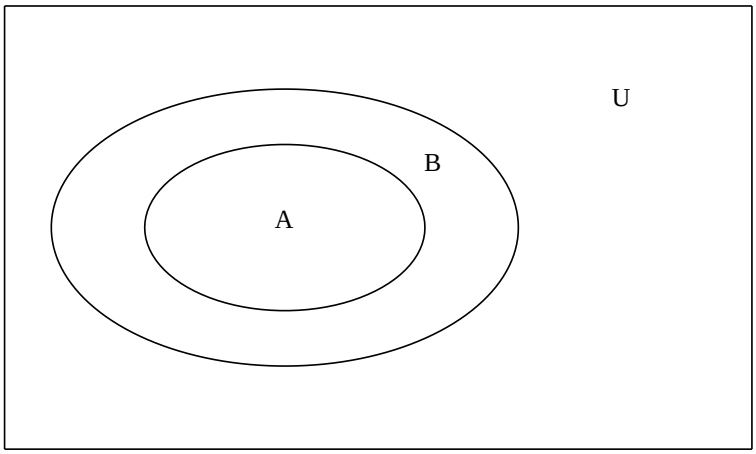

Figure 1.2 A Venn diagram illustrating two sets A and B where $A \subset B$, and the universal set U.

2.12. $\mathbb{C}$
2.13. $\mathbb{Z}$
2.14. $\{x|5 < x < 10\}$
2.15. $\{x|x \in \mathbb{R}\}$