Assignment 1

1. (a) $\{4, 6\}$ (b) $\{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
(c) $\{4, 5, 6, 8, 10\}$ (d) $\{0, 2, 4, 6, 7, 8, 9, 10\}$

2. (a) $|\phi| < |A-B| < |A \cup B| \leq |A \oplus B| \leq |A| + |B|$
(b) $|\phi| \leq |A \cap B| \leq |A| \leq |A \cup B| \leq |U|$

3. (a) symmetric
(b) reflexive
(c) reflexive
(d) transitive

4. (a) ℓ, m
(b) a, b, c
(c) k, ℓ, m
(d) b, c, e

5. (a) countably infinite. $(0) \to 0$, $(0,0) \to 1$, $\cdots$, $\overbrace{(0,0,0,\cdots,0)}^{n+1} \to n$, $\cdots$
(b) uncountable

(c) finite

(d) countably infinite. $R: A \to B$, $R = \begin{cases} (-1)^n \cdot 6 \cdot \frac{n}{2}, & n = 2k \\ (-1)^n \cdot 6 \cdot \frac{n+1}{2}, & n = 2k-1 \end{cases}$ $(k \in \mathbb{N})$