1. List all the elements of each set:
   (a) \( \{x \in \mathbb{R} | x^2 = 1\} \)
   (b) \( \{x \in \mathbb{Z} | x \in [-4, 1)\} \)
   (c) \( \{x \in \mathbb{Z} | x^2 = 2\} \)

2. Let \( A = \{2, 4, 6\} \), \( B = \{2, 6\} \), \( C = \{4, 6\} \), \( D = \{4, 6, 8\} \). Determine which of these sets are subsets of which others.


4. Show that for every set \( S \), \( S \subseteq S \).

5. (a) List all elements of \( \mathcal{P}(\{a, b\}) \).
   (b) List all elements of \( \mathcal{P}(\mathcal{P}(\{a, b\})) \).

6. (a) Show that if \( A \subseteq B \), then \( \mathcal{P}(A) \subseteq \mathcal{P}(B) \)
   (b) Show that if \( A = B \), then \( \mathcal{P}(A) = \mathcal{P}(B) \)

7. Show that if \( A \subseteq B \), then \( A \times C \subseteq B \times C \) for every set \( C \).