1. Let $A = \{1, 2, 3, 4\}$. How many possible partitions of $A$ exist?

2. Let $B = \{1, 2, 3, 4, 5, 6\}$ Find partitions $S$ of $B$ for which
   
   (a) $|S| = 3$
   
   (b) $\{5\} \in S$

3. Let $C = \{a, b\}$. List the elements of $C \times \mathcal{P}(C)$.

4. List the elements of $D = \{(x, y) \in \mathbb{Z} \times \mathbb{N} : |x| + |y| = 3\}$. 