Problem 0(a)

Theorem 1 ($|A| = 0 \implies |\mathcal{P}(A)| = 1$)**.** *The power set of the empty set has one element.*

Proof. Constructing the power set of $\emptyset$ (i.e., the empty set), the definition of the power set gives $\mathcal{P}(\emptyset)$ equal to $\{\emptyset\}$. We see that there is one element in $\mathcal{P}(\emptyset)$. ■