## Homework 1

Due: September 10, 2019

## Name:

1. (15 points) Consider two sets $S_{1}=\{1,2,3,4,5\}$ and $S_{2}=\{1,3,5,7,9\}$. Compute the following:
(a) (5 points) $S_{1} \cup S_{2}=$
(b) (5 points) $S_{1} \cap S_{2}=$
(c) (5 points) $\left|S_{1} \cap S_{2}\right|=$
2. (20 points) Consider a sets $\Omega=\{1,2,3,4\}$
(a) (10 points) Write the power set $\mathcal{P}(\Omega)$
(b) (5 points) What is the cardinality of $\mathcal{P}(\Omega)$ ?
(c) (5 points) For a general (non-empty) set $A$, what is the relationship between the cardinality of $A$ and the cardinality of its power set?

$$
\begin{aligned}
& \geq \\
& > \\
\operatorname{card}(A) & \leq \operatorname{card}(\mathcal{P}(A)) \\
& < \\
& =
\end{aligned}
$$

