8100 Problem Set 1.

August 31, 2021

Prove the following results. Unless otherwise stated, assume $\succeq$ is complete and transitive and $\succ$, $\sim$ are as defined in the notes.

1. *If $\succeq$ is complete but intransitive there is some budget $B \subseteq X$ with $\#(B) \geq 3$ such that $C(B) = \emptyset$.*

2. *If $\succeq$ is complete and transitive, then $\forall x, x' \in X$ either $\succeq (x) \subseteq \succeq (x')$ or $\succeq (x') \subseteq \succeq (x)$.*

3. $\succ \cup \sim = \succeq$ & $\succ \cap \sim = \emptyset$.

4. $\sim (x) = \succeq (x) \cap \preceq (x)$.

5. $\succeq (x) = \sim (x) \cup \preceq (x)$.

6. $\sim$ is transitive but not necessarily complete.

7. $\succ$ is transitive but not necessarily complete.