Well Ordering Principle

证 existence 用 WOP.

1. WOP: Every set of natural numbers that contains at least one element has a smallest element in it. ($\forall S \subseteq \mathbb{N}, S \neq \phi \Rightarrow S$ has smallest).

使用条件:
① non-empty.
② subset of $\mathbb{N}$.

1). 用法: 结合反证法, 证某个性质. 设某个性质不成立, 考虑不成立的集合; 用了反证, 相当于集合不空. 由于属于 $\mathbb{N}$. 用 WOP 找到最小元素, 用其导出矛盾.

2. Proof on Quotient-Reminder Formula.

Quotient-Reminder Formula: $\forall n, d \in \mathbb{Z}$, $d > 0$, there are unique integer $r \in \{0, 1, 2, \ldots, d-1\}$ and q s.t. $n = dq + r$.

To prove uniqueness. we assume two diff.
$n = dq_1 + r_1$
$n = dq_2 + r_2$.

PS2 Q3(b).

3. Prove Complete Induction using WOP.