

## Problem 1

1.  $\dots$ 

2. "add to obtain"

## Problem 2

(a)  $|E \cup \{e\}| = |V| \rightarrow$  cyclic.(b) by (a) when we add  $\{e\}$  we get

a cycle. So we remove another edge

from the cycle.  $E - \{e'\} \cup \{e\}$  is

a tree.

(c) if  $\forall e' \in S \rightarrow S \cup \{e\}$  would have a cycle.

(d) Proof. by Induction.

I.H.  $P(m) := m < |V| \rightarrow \exists E, S_m \subseteq E$ B.C.  $P(0)$  ✓I.S.  $e$  is the  $(m+1)$ st edge,Case 1,  $e \in E$  ✓Case 2, by lemma 4  $e \in E^*$  $E^*$  is mst because  $wt(e) < wt(e')$ (else  $S \neq E \rightarrow$  keeps running)