

Suppose by way of contradiction that  $T$  and  $T'$  are two distinct minimum spanning trees of  $G$ . Since  $T$  and  $T'$  have the same number of edges, but are not equal, there is some edge  $e'$  in  $T'$  but not in  $T$ . If we add  $e'$  to  $T$ , we get a cycle  $C$ . Let  $e$  be the most expensive edge on this cycle. Then by the Cycle Property,  $e$  does not belong to any minimum spanning tree, contradicting the fact that it is in at least one of  $T$  or  $T'$ .