

Show **ALL** work for credit; be neat; and use only **ONE** side of each page of paper.

1. Draw the binary trees.

- A. The smallest binary tree containing the vertices with level order numbers 56, 58, 19, and 7.
- B. The vertices in postorder are  $DHFBGCAE$  and the vertices in inorder are  $DFHEBAGC$ .

2. Prove by (strong) induction of the number of **CYCLE** edges (say  $n$ ): A connected graph has  $|E| \geq |V| - 1$ .  
[Note that strong induction is required.  $C_n$ , the cycle graph, has  $n$  cycle edges, but once you remove the edge  $e$ , the number of cycle edges in the resulting graph,  $C_n - e$ , is zero.]