1) (10 pts) ALG (Binary Search Trees)

(a) (6 pts) Following are three traversals produced by the exact same **binary search tree**. Using your powers of inference, determine which one is which. (Fill in each blank with "in-order," "pre-order," "post-order.") ***(Note: All sets of answers which don't contain each traversal exactly once will automatically be awarded 0 points.)***

_____ traversal: 18 14 12 9 31 24 19 22 23 36

_____ traversal: 9 12 14 23 22 19 24 36 31 18

_____ traversal: 9 12 14 18 19 22 23 24 31 36

(b) (1 pt) What value must be at the root of the BST that produced the traversals listed in part (a)?

(c) (1 pt) Using big-oh notation, what is the best-case runtime for searching for a particular value in a BST with *n* nodes?

(d) (1 pt) Using big-oh notation, what is the worst-case runtime for searching for a particular value in a binary tree (a regular old binary tree, not necessarily a BST) with *n* nodes?

(e) (1 pt) Using big-oh notation, what is the worst-case runtime for searching for a particular value in a BST with *n* nodes?