

# Quiz 6

## (solutions)

1. There is a tree where the left subtree contains 1000 nodes, and the right subtree contains 100 nodes. For preorder, inorder, and postorder traversals, how many nodes are processed before the root?

Pre: \_\_\_\_\_ **0** \_\_\_\_\_

In: \_\_\_\_\_ **1000** \_\_\_\_\_

Post: \_\_\_\_\_ **1100** \_\_\_\_\_

2. What is the maximum number of leaves in a binary tree of height H?

$$2^H$$

3. Suppose that we have numbers between 1 and 1000 in a binary search tree and want to search for the number 363. Which of the following sequences could NOT be the sequence of nodes examined? Circle your answer.

a) 2, 252, 401, 398, 330, 344, 397, 363.

b) 924, 220, 911, 244, 898, 258, 362, 363.

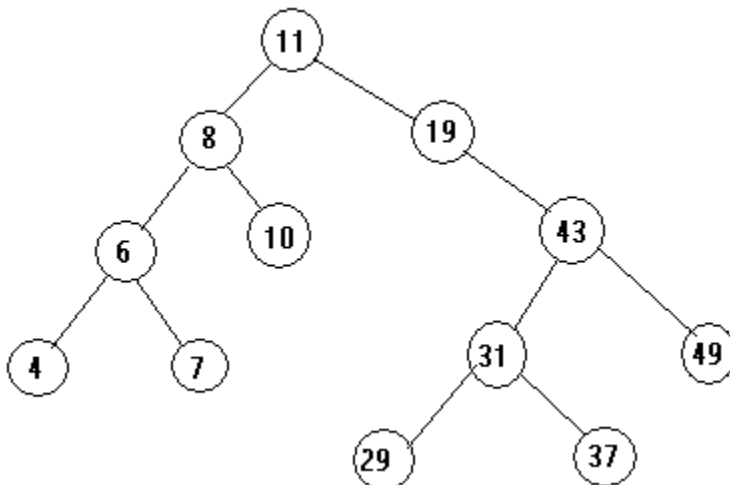
**c) 925, 202, 911, 240, 912, 245, 363.**

4. Draw a binary tree T such that

- each node stores a single number and

- a preorder traversal of T yields 11, 8, 6, 4, 7, 10, 19, 43, 31, 29, 37, 49 and

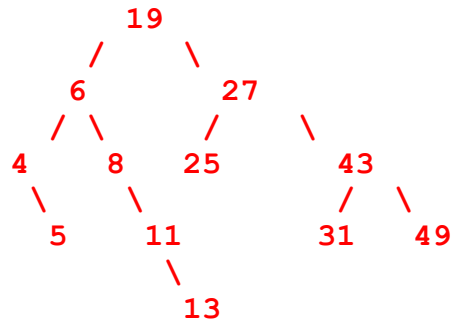
- an inorder traversal of T yields 4, 6, 7, 8, 10, 11, 19, 29, 31, 37, 43, 49



5. Given a sequence of numbers:

19, 6, 8, 11, 4, 13, 5, 27, 43, 49, 31, 25

a) Draw a binary search tree by inserting the above numbers from left to right



b) If you remove 19 from the binary search tree from part (a) using the standard removal algorithm for binary search trees, draw the TWO potential binary search trees that you can end up with.

